NEW
ELECTRONIC SWITCHING SYSTEMS
CIRCUIT DOCUMENTATION

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1. GENERAL

A. Scope

1.01 This document describes the circuit documentation methods used in the circuit drawings (SDs) of electronic switching systems (ESSs) such as No. 3 and No. 4 and the 1A processor.* In developing wiring details for the extensive circuitry of these systems, machine aids were used almost exclusively. Similar methods have been used, where possible, in the preparation of the circuit documentation. For this reason, information in parts of the SDs described herein will reflect the use of machine-aided methods in their preparation. This document will describe only those areas of SD documentation in which the methods described herein have been used in place of other methods. For all other areas of SD documentation, the methods outlined in Section 005-110-101† apply.

1.02 This section is reissued to bring the information it contains into agreement with the latest practices. Since this reissue covers a general revision, the arrows ordinarily used to indicate changes have been omitted.

B. SD Types

1.03 The documentation arrangements and methods covered in this document apply to four types of SDs:

(a) Functional unit SDs

(b) Frame unit SDs

(c) Frame SDs

(d) Circuit pack information (CPI) SDs

1.04 ***Functional Unit SDs:*** These SDs cover circuitry capable of functioning on a stand-alone basis. In this SD category, a functional entity has its physical counterpart realized in a corresponding J-coded unit. The quantity of circuitry in these SDs can range from an amount occupying an entire frame, as in the case of the central control circuit of the 1A processor, to smaller units occupying only part of a frame.

1.05 ***Frame Unit SDs:*** These SDs cover circuit units used either in a single frame or in a number of separate frames. A frame unit SD will often appear repetitively on a particular frame SD. The circuitry of these frames is covered in paragraph 1.06. Frame unit SD documentation is intended to be used only in conjunction with documentation of frame SDs.

1.06 ***Frame SDs:*** The principal purpose of these SDs is to document the interconnecting circuitry between the frame units covered in paragraph 1.05. In this type of SD, connections are also shown between frame units and nonframe unit circuit packs (CPs) that are part of the circuitry covered by a frame SD. It is through the interconnections documented in frame SDs that functions comparable to those of functional unit SDs are realized on a frame basis.

1.07 ***Circuit Pack Information (CPI) SDs:*** These CPI SDs serve two purposes: to list all of the CPs used in a system and to collect, on a system basis, all of the circuit documentation on circuit modules (CMs) and integrated circuits (ICs).

C. SD Sectionalization

1.08 The SD types described in paragraphs 1.03 through 1.06 are all sectionalized, and the sections are identified with standard section letters. Sectional content corresponding to each of these section letters is given below.

SECTION	CONTENT
A	Drawing Indexes
B	Functional Schematics (FSs)
C	Apparatus Figures (App Fig.)
D	Circuit Notes and Tables
E	Sequence Charts (SCs)
F‡	Circuit Requirements Tables (CRTs)

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* These systems are the first to use what is referred to as "1A Technology"

† To be issued.

‡ Little use of this section is likely because of the relatively small use of relays and similar wired-in-place components.

SECTION	CONTENT
G	Cabling Diagrams (CADs)
H	Block Diagrams (BDs)
J*	Circuit Pack Schematics (CPSs)
K†	Circuit Module Schematics (CMSs)

D. SD Section-to-Circuitry-Level Relationship

1.09 In general, circuitry in circuit units occurs at four separate levels: the backplane, CP, CM, and IC levels. The SD sections in which these circuitry levels are documented are listed below.

CIRCUITRY LEVEL	SD SECTION
Backplane	B
CP	J*
CM	K†
IC	D†

1.10 ***SD Section Categories:*** The ten sections listed in paragraph 1.08 fall into two categories: circuitry sections and auxiliary sections. The circuitry sections are B, J, and K; the auxiliary sections are A, C, D, E, F, G, and H. The auxiliary sections contain information that generally supplements the information in the B section, nominally the focal point of the SD.

E. Circuitry-Level Documentation

1.11 ***CP Level:*** The first three SD types listed in paragraph 1.03, namely, the functional unit, frame unit, and frame SDs, do not usually have J and K sections. For these SDs, the J-section documentation for CPs appears in separate CPS drawings with drawing numbers consisting of the prefix CPS followed by the alphanumeric apparatus code of the documented CP (eg, CPS-FA123). With respect to information content and arrangement, these CPS drawings approximate the standard format for the J section of SDs.

1.12 ***CM and IC Levels:*** The K-section information on CMs for a system as a whole is shown in a CPI SD. This SD also contains a D section for all of the information on ICs used in the system CMs and CPs. This SD will also have a brief J section that lists all of the system CPs by code number and with references to the using system SDs. [See **5. CIRCUIT PACK INFORMATION SDs (CPI SDs).**]

1.13 ***Backplane Level:*** The functional unit, frame unit, and frame SD types differ from each other and from SDs in general with respect to the documentation of backplane circuitry in the B section. For this reason, this document will focus on the documentation methods for the B sections of these SD types. The G section for CADs will also receive particular attention with respect to some of the SD types.

2. FUNCTIONAL UNIT SDs

A. B Section, Functional Schematics (FSs)

General

2.01 B-section circuitry as documented in the functional unit SD consists of three parts:

(a) Interconnection and flow diagrams (IFDs) that indicate backplane interconnections between CPs and other components in block diagram form.

(b) Connection list tables that provide CP and other component terminal connection details of all IFD leads.

(c) Composite diagrams that represent, in one or more composite forms, the circuit functions not readily apparent from IFDs alone.

Interconnection and Flow Diagrams (IFDs)

2.02 IFDs indicate the connections between CPs and other components at the backplane level. The CPs are represented with rectangular symbols and the backplane circuitry is indicated with FS and symbol number, or name destinations, at the stub ends of IFD symbol lines. Signal flow direction is indicated on these lines with directional arrows. Connections between symbols on the same IFD are shown with connecting lines.

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* The use of independent CPS drawings eliminates the need for coverage in the J section of the using SD.

† The use of CPI SDs eliminates the need for coverage of CMs and ICs in the K and D sections of the using SD.

2.03 ***FS to IFD Relationship:*** For each FS in the B section there is only one IFD. Despite this kind of B-section makeup, the term FS will continue to be used for the purpose of associating the B-section FSs with the 3-part makeup of the FSs listed (refer to paragraph 2.01).

2.04 ***Symbol Numbers:*** To aid in identifying rectangular symbols within IFDs, and referring to them in FSs of the B section and in other parts of the SD documentation, IFD symbols are assigned symbol numbers, eg, SYMBOL NO. 1, SYMBOL NO. 2, etc. A symbol number is the first line entry in a symbol. Symbol numbers are generally assigned in numerical sequence from left to right and from top to bottom, beginning with the number 1 in each FS.

2.05 ***Other Symbol Entries:*** In addition to number entries in IFD symbols, there are customary entries for rectangular symbols, as follows:

(a) The functional name or description of the CP represented by the symbol.

(b) The functional designation assigned to (a).

(c) The plug-in location of the CP within the equipment shelf, otherwise referred to as the CP equipment location.

(d) The code number (apparatus or equipment) of the CP.

(e) The CP element identifier (see paragraph 2.06).

(f) The composite diagram number (this entry is to be included when it is necessary to establish a particular symbol-to-composite-diagram relationship).

Typical symbol entries corresponding to (a) through (f) are shown in Fig. 1 in their usual arrangement.

2.06 ***CP Element Identifier:*** The CP element-identifier letter, the last or next-to-last line within an IFD symbol, identifies one or more separately identifiable circuitry subdivisions on a CP. These subdivisions can comprise the same or different circuitry. CP subdivisions are identified with the letters A, B, C, etc. The CP element identifier letter A is entered in a symbol even when there are no CP (circuitry) subdivisions.

2.07 ***Circuit Lead Destination Indication:*** Destinations of IFD leads from FS to FS are indicated in one of two ways. One way is by indication of an FS and symbol number destination at the end of a lead line, as shown in Fig. 1 and Fig. 16. The other way, also shown in Fig. 16, is by the indication of an FS destination within a double-line enclosing rectangle. The FS title is also shown in the rectangle. Lead destinations to other SDs are given at the end of lead lines with a circuit name (eg, TO ENABLE VERIFY CKT). When additional details are required, destinations to other SDs may also be shown in double-line enclosing rectangles. Specific information on backplane terminations of FS leads is obtained from the connection list tables that follow the IFDs. Details concerning these tables are covered in Connection List Tables (refer to paragraphs 2.10 through 2.13).

2.08 ***Circuit Leads—Identification:*** In IFDs, a single line represents one or more backplane circuit leads. The corresponding lead designations are shown above the IFD lead lines. When a lead line represents more than one lead, the number of leads is indicated below the lead line in parentheses, as shown in Fig. 1.

2.09 ***Test Connectors:*** Test connectors are those connectors engineered for front access testing. This category does not include connectors used as terminal strips which should appear in CAD figures. When test connectors are part of the FS (backplane) circuitry, they will be represented in IFDs with symbols in the same manner as CPs. These test connector symbols will also include an equipment location entry and a functional designation entry, if one has been assigned.

Connection List Tables

2.10 Connection list tables provide specific CP and other component terminal information not shown in the IFDs. For each IFD symbol within an FS, there is a separate connection list table. This is also done for symbols for test connectors. For each designated IFD lead, there is a corresponding lead designation entry in a connection list table with the same symbol number. The purpose of connection list tables is to provide near-end connection information for backplane leads terminating at specific CP or other component terminals. These tables also provide the far-end destination in the documentation, ie, the FS and symbol number at which a lead terminates.

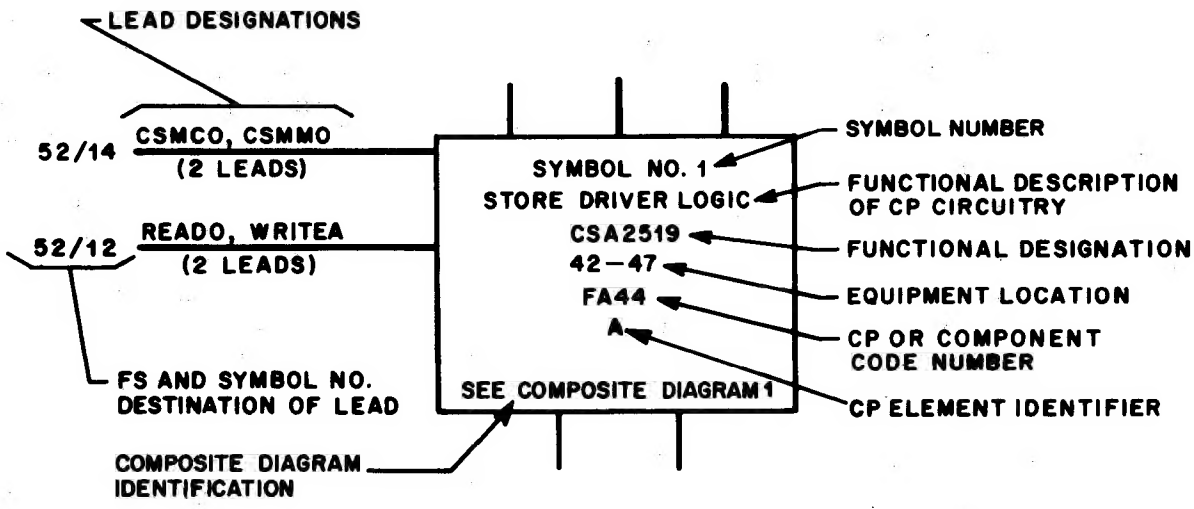

Fig. 1—Typical IFD Symbol Entries, Lead Line Designations, and Method of Indicating Their Destination

When the destination of a lead is another SD, the title of the SD is given in the table.

2.11 ***Connection List Table Headings:*** Connection list tables have headings that correspond to all of the line entries in IFD symbols. A typical table heading and column entry arrangement is shown in Fig. 2.

2.12 ***Connection List Table Columns:*** The contents of each of the separate columns are as follows:

COLUMN	EXPLANATION
LEAD DESIG	The same designated leads associated with a particular IFD symbol (input or output) are listed in this column in alphanumeric order. The first entry in this column appears after the last unused (active) CP terminal number entered in the TERM. column. (Unused [active] CP terminals appear with NC [no connect] in the lead designation column.) Typical LEAD DESIG column entries are shown in Fig. 17, Sheets 1 and 2.
FUNC	The letters I or O are the usual entries in this column. They indicate whether a lead is essentially an input or output lead of a circuit element, such as a gate on a CP. When the output lead of such a gate is connected to the output lead(s) of another gate(s), located on the same or another CP, the letter combination OT is entered in the column. The letter T indicates that the transistor collectors of two or more gates are connected in a wired-node manner. Other letter functions that may be used are IO (input-output), OI (output-input), OIT (output-input-wired-node connection), and LR (load resistor). The choice of IO versus OI is determined by the dominant function. GRD and PWR entries made in this column indicate that the particular CP leads are, respectively, the ground and power terminals of a CP.

COLUMN	EXPLANATION
TERM. MOD	Entries in this column show the lead designation by which a CP termination is identified in a CPS drawing. This entry is referred to as the terminal modifier or lead function (Net Name) at the CP level.
TERM.	Terminal numbers of CPs or other components are entered in this column. Used and unused (active) terminals are listed in this column, with the unused preceding the used terminals. Connections internal to a CP (not part of the backplane) between CP circuit elements A, B, C, etc, are identified with the letters IC (internal connection) or a combination of these letters and a CP terminal number, if a CP terminal is involved.
WRG OPT	Entries in this column identify wiring which is connected only when the indicated option is specified. In some cases, wiring options are shown within parentheses in the DESTINATION column preceding the destination.
DESTINATION	In this column, the FS-to-FS destinations shown in the IFDs are listed on an individual lead basis. Following the slash line of this entry, the symbol of the FS involved is also shown. Multiple FS and symbol number entries are separated with commas, as shown in Fig. 17, Sheet 1. Option letters, when applicable, are shown in parentheses in front of each optional destination. Also shown in this column are destinations to other circuits.
NOTE	This entry is for reference to lead wiring requirements that are usually covered either in FSs with an indication of pairing, or in a 200-series equipment note on the SD. When reference is made to a sheet note in this column, the note will be shown directly below the table. A typical entry for indicating wire pairing would appear as P/3G042H1, indicating that the lead in the LEAD DESIG column is paired with lead 3G042H1.

2.13 ***Example Illustrating Use of IFD and Connection List Table Information:***

(a) For the purpose of this example, lead AASCSA0A of symbol No. 1 will be used. This is the same designated lead shown in Fig. 2. At the end of the lead line in the upper right of the IFD (coordinates B8) in Fig. 16, 54/1 is shown, indicating that the other end of the lead appears in FS54, SYMBOL NO. 1 in the B-section documentation (Fig. 18, coordinates F0). For leads in Fig. 16 shown terminating in double-line rectangles, the destination to the other FS is arrived at in a similar manner except for the omission of a symbol number.

(b) For the functional meaning of the lead designation, AASCSA0A, the Designation Mnemonics Index should be consulted (Fig. 19). For the mnemonic part of the lead designation AASCSA, this index shows that the lead is associated with the auxiliary-unit-sequencer to call-store-address-bus signal flow. For information on the character significance makeup of lead designations, refer to paragraph 2.18.

(c) To determine the specific terminal to which lead AASCSA0A is connected on a CP (designated CSA2519, see Fig. 17, Sheet 1), the Connection List Table for symbol No. 1 should be consulted. This list shows that the lead FUNC is I, confirming the direction shown in the IFD, and that it connects to CP terminal 107. The CP designation CSA2519 is shown at the top of the table under DESIG. The DESTINATION entry 54/1 indicates that the other end of the connection or lead is at FS54, SYMBOL NO. 1, as shown in Fig. 18.

SYMBOL NO. 1

STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA2519	42-47	FA44	A	

LEAD DESIG	FUNC	TERM. MOD	TERM.	WRG OPT	DESTINATION	NOTE
NC	ø	01010	302			
•	•	•	•			
•	•	•	•			
•	•	•	•			
•	•	•	•			
AASCSAOA	I	GSCB00	107	Z	54/1	
•	•	•	•		•	
•	•	•	•		•	

Fig. 2—Connection List Table and Column Headings for Functional SDs

The TERM. MOD entry shows that in the CP drawing, CPS FA44, the CP terminal to which this lead is connected has been assigned the identification GSCB00. This lead is located in the CPS FA44 drawing at coordinate A1 as shown in Fig. 20, Sheet 1. This TERM. MOD GSCB00 is also listed in the CP tabular SYMBOL 1, shown in Fig. 20, Sheet 2.

Composite Diagrams

2.14 The purpose of these diagrams is to provide the functional information normally conveyed in FSs, but which is absent from the IFDs. Composite diagrams provide this information for circuit understanding and are therefore an essential part of the FS documentation in the B section.

2.15 ***Composite Diagram Forms:*** Information in composite diagrams can take one of several forms, ranging from abbreviated diagrammatic functional representations to Boolean algebraic expressions. Diagrammatic representations of different makeup are the forms most commonly used for conveying the time-dependent functions of sequential (synchronous) circuits. Boolean algebraic expressions are restricted mainly to representing the combinational logic of the circuit segments of the larger sequential circuits. The composition of the diagrammatic part of the composite diagram can include some or all of the following specific types of diagrams and information: functional block diagrams; abbreviated logic diagrams, per se; timing diagrams; state diagrams; truth tables; and word descriptions. The composite diagram portion of the sample FS in Fig. 21 uses three of these types of information forms: a functional block diagram, an abbreviated logic diagram, and a word description. The functional block diagram, Composite Diagram 1 in this case, establishes the overall circuit functions of the call store address bus drivers. General functional grouping of leads used for accessing, enabling, and selection are indicated. In an abbreviated manner, Composite Diagram 2 shows the essential logic functions involved in the accessing, enabling, and bus selection functions of the FS circuitry. The single line representation used in this diagram is consistent with the abbreviated presentation of such information.

2.16 ***Circuit Operation:*** For each FS, a brief description of circuit objectives and operations, titled CIRCUIT OPERATION is provided either as part of or separate from composite diagram information as shown in Fig. 21. The text of this information is presented in a manner that will permit easy correlation with diagrammatic information in the related IFDs and composite diagrams.

2.17 ***State and Timing Diagrams:*** When circuitry depicted in an FS functions in a sequential mode, information in addition to that shown on the composite diagram, Fig. 21, will usually be shown. This additional information will define the specific input-output characteristics of the circuit. For this, state or timing diagrams, or both, are shown in addition to abbreviated logic and block diagrams. These additional diagrams are used to depict the succession of output states through which the circuit passes as its input signals vary. Also included are the internal state transistions that a circuit undergoes for each condition of circuit output. Tables of the truth-table type may also be used to supplement the information of the additional state and timing diagrams.

2.18 ***Designations, Character Significance:*** Component, lead, and symbol designations for the ESS systems and projects are limited to eight characters. The makeup and significance of character grouping within a designation are as follows:

1 2 3 4 5 6	7	8
X X X X X X	X	X
Mnemonic	Polarity or logic state	Fanout branch

The mnemonic part of a designation usually consists of from one to six characters, but may include as many as seven if the character for indicating fanout branching is not used. Multicharacter designations are usually in an alphanumeric format. The mnemonic part of the designation conveys functional information. The polarity or logic state character is either a 1 or a 0, depending on the state of a lead during its active condition. Positive logic interpretation of the 1 or 0 applies. The fanout branch character is used to distinguish between several leads with the same function (mnemonic).

2.19 ***B Section, Sheet Numbering:*** Sheet numbers of drawing sheets in the B section are made up of the FS number that may appear on one or more sheets and a double alpha suffix, depending on whether the sheets are part of the IFD, the connection list table, or a composite diagram. For example, the first sheet of FS2 (of the IFDs) would be numbered B2AA. The double alpha suffixes used for the IFDs, the connection list tables, and composite diagrams are as follows:

IFDs—AA through AY and BA through BY

Connection list tables—CA through CY, DA through DY, EA through EY, and FA through FY

Composite diagrams—GA through GY, etc

B. A Section, Drawing Indexes

2.20 The A-section indexes facilitate location of circuitry components, leads, and options in the B, C, and G sections of a functional unit SD. There are five indexes, titled Sheet Index, Designation Mnemonics Index, Apparatus Index, Lead Index, and Option Index. As to their use in the functional unit SD, only the contents of the apparatus, designation mnemonics, and lead indexes will be covered in this document. The other indexes, when used, will conform with existing practices.

2.21 ***Designation Mnemonic Index:*** This index lists in alphanumeric order the mnemonic and the definition of all lead and component designations used in the SD. For lead designations, the FS number of the initial output is provided. For leads connecting to external circuits, the FS number of the first appearance of the lead designation is provided. Typical entries are shown in Fig. 19.

2.22 ***Apparatus Index:*** This is an index of CPs and similar components used in the circuit. Consistent with the fact that CPs are the most prevalent components in the newer ESS circuits, the apparatus indexes will usually consist mainly of one or more listings pertinent to CPs. Given, for example, the functional designation of a CP, the user of the SD can determine from the apparatus index where CP circuitry is represented in the B section (by FS and symbol number), where a CP is listed in an App Fig. of the C section, and where it is physically located in the equipment. Two kinds of tabular listings are used in the ESS SD apparatus indexes. One is for listing CPs by equipment location in numerical order and the other is for listing CPs by functional designation in alphanumeric order. See Fig. 3(a) and 3(b) for apparatus index examples.

EQPT LOC	APP FIG. NO.	APP FIG. SH NO.
CIRCUIT PACKS		
22-31	2	C3

Fig. 3(a)—Apparatus Index by Equipment Location

DESIG	LOCATION FS/SYM	LOCATION APP FIG.	LOCATION EQPT
CIRCUIT PACKS (CP)			
LMO	3/7	2	22-31

Fig. 3(b)—Apparatus Index by Functional Designation

DESIGNATION	LOCATION FS/SYM	LOCATION CAD/SHEET
EXTERNAL CIRCUIT TITLE		
ABC00	12/6	4/GB5

Fig. 4(a)—Lead Index With the Same External and Internal Lead Designations

DESIGNATION EXTERNAL	DESIGNATION INTERNAL	LOCATION FS/SYM	LOCATION CAD/SHEET
EXTERNAL CIRCUIT TITLE			
ABC00	DEF00	17/3	4/GB7

Fig. 4(b)—Lead Index With Different External and Internal Lead Designations

2.23 ***Lead Index:*** Headings for indexes of leads to external circuits will consist of titles (names) of the external circuits (eg. PROC PERIPH BUS CKT) listed in alphabetical order. Each lead will refer to an FS number and symbol number (FS/SYM), and a CAD number and sheet number (CAD/SHEET). Under each of the circuit names, leads are listed in alphanumeric order. [See Fig. 4(a).] When the lead designations of connecting circuits do not agree, the noncontrolling circuit lead index shall provide an additional designation column to show the required translation. [See Fig. 4(b).]

2.24 ***Option Indexes:*** These indexes indicate the documentation locations of optional components and circuitry.

C. C Section, Apparatus Figures

2.25 ***CP App Fig. Tabular Arrangement:*** By their arrangement, CP tables convey the relative physical locations of CPs from bottom to top and left to right of the equipment bay or the frame housing them, as viewed from the equipment side. This location is shown as the first line entry in the table as EQPT LOC as shown in Fig. 22. For a typical entry, such as 42-47, the coordinate 42 indicates that CP CSA2519 is located in a shelf 42 inches up from the bottom of the bay or frame. Coordinate 47 indicates that this CP is located in the 47th slot from the left side of the bay or frame. Each App Fig. begins with the lowest shelf of the group of CP shelves comprising the App Fig. From such CP App Fig. tables, the physical disposition of all CPs within a bay or frame can be determined without consulting an equipment drawing.

2.26 ***CP Circuit Elements:*** When a CP consists of a single circuit element or entity, there is a single entry in the CP table that aligns with the circuit element letter A shown at the end of the table. CPs having more than one identifiable circuit element have additional entries corresponding to the number

of such circuit elements. These are shown in alignment with the table letters B, C, etc, as shown in Fig. 22. These circuit element letters are also the last or next-to-last line entries in IFD symbols.

2.27 ***Components:*** The location of components other than CPs is also given in the App Fig. by FS and symbol number.

D. D Section, Notes and Tables

2.28 In this section the usual circuit, equipment, and information notes are shown as required. Information likely to appear in functional unit SDs under each of these note categories is described in paragraphs 2.29 through 2.31.

2.29 ***Fusing Note, 101:*** In the table for this note, a reference may be made to a power distribution type of SD for information relating to the allocation of the on-circuit-frame primary fuses. Otherwise, entries in the table are made in accordance with existing practices.

2.30 ***Circuit Notes, General:*** With respect to other 100-series circuit notes such as the feature or option and record of changes notes, information content and arrangement is in accordance with existing practices.

2.31 ***Equipment Notes:*** These 200-series notes will usually specify such wiring requirements as cannot be indicated or conveyed in the IFDs and connection list tables. Among the requirements usually covered are those related to critical wiring. Typically, these can specify the wiring run limits over which a particular type of wire or coaxial cable is to be used.

2.32 ***Information Notes:*** The 300-series notes may contain a table of the CP codes and their lowest acceptable series number which may be used in the circuit. When required, this table is usually contained in Note 302 and worded as follows:

302. The following table lists all the circuit pack codes used in this circuit and their lowest acceptable series number. A circuit pack of a higher series number should not be used if coordination is required with an outstanding class A change.

CP CODE	SERIES NUMBER

E. E Section, Sequence Charts (SCs)

2.33 ***General:*** An E section for SCs is usually included for the ESS synchronous sequential circuits such as are covered in a functional unit SD. Such SC information will consist of diagrammatic representations (DRs), timing charts (TCs), and internal state diagrams (ISDs) in the standard manner. SC information may be shown in some instances as part of the makeup of composite diagrams.

F. G Section, Cabling Diagrams (CADs)

2.34 ***General:*** In functional unit SDs, and in the newer ESS SDs, the G section is generally divided into two subsections, GA and GB. Subsection GA is for graphical manually-prepared CADs and GB is for tabular machine-prepared CADs. Graphical CADs are used in the ESS SDs only when connections to adjacent terminating devices vary frequently and in a manner not easily interpreted from a tabular-type presentation. Since graphical CADs, when used, will conform to standard practice, the remainder of **2. F. G Section, Cabling Diagrams (CADs)** will be devoted to explaining the arrangement and interpretation of the newer machine-prepared tabular CADs.

2.35 ***Machine-Prepared Tabular CADs:*** All tabular CADs are supplemented with graphical-equivalent representative notes at the beginning of the GB subsection. A typical tabular CAD with the usual headings and line entries is shown in Fig. 23. In Fig. 5, the headings and line entries of part of the Fig. 23 CAD are shown. The equivalent graphical representation of the tabular entries of Fig. 5 are shown in Fig. 6.

2.36 ***Tabular CAD Headings and Interpretation:*** Immediately under the CAD number caption, a general heading for the entire CAD plus the associated App Fig. number is indicated (eg, LEVEL 065 TO 069 INTRAFRAME CABLING APP FIG. 3). Below this heading and above each of the three major tabular columns on a CAD sheet, as shown in Fig. 23, there is a subcaption for each set of columns of the tabular arrangement, such as is shown at the top of Fig. 5. The FROM CONNECTION and TO CONNECTION headings on the first line of this subcaption convey the equivalent of the "shop" and the "installer" information side, respectively, of CADs. The significance of the other parts of the subcaption can be seen from the equivalent graphical representation shown in Fig. 6. The JACK/TS below the subcaption

to the right in Fig. 5 indicates that the right side (shop side) of the CAD involves connections (wire runs) from a CP connector located at coordinate 72-28, to another CP connector located at coordinate 65-47, with no CP plugged into it. This connector serves as an intermediate connecting point device (staging area). Over the backplane pins of this connector, there is a Berg (female) connector designated J4, as shown in the subcaption. To this Berg connector a flex cable, CA141*, is attached, as shown in Fig. 5 and 6. The other end of this cable is terminated directly to the CP connector pins at location 69-47, as shown in Fig. 5 and 6. The particular lead designations and terminal numbers on CP connectors are also indicated as part of the tabular information. An entry in the subcaption of JACK/CP rather than JACK/TS would indicate the omission of an intermediate connecting point from location 72-28 to location 65-47. In this case, the initial CP Location could be, for example, at 65-47. The note in parentheses in the subcaption, to the right of JACK/TS, is a reference to the graphical equivalent representation shown at the beginning of the CAD section.

G. H Section, Block Diagrams (BDs)

2.37 ***General:*** When H sections for BDs are included in functional unit or other ESS SDs, they will be presented in the usual manner.

3. FRAME UNIT SDs

A. General

3.01 Frame unit SDs document the circuitry of units that are wired together in a frame. In many cases, a particular unit will be used repetitively in a frame, similar to the multiple use of a CP in a circuit unit. This being the case, the documentation in these SDs is arranged substantially the same as in functional unit SDs. The most significant area in which the two SD types differ is in the G-section documentation, as covered in paragraphs 3.03 and 3.04.

B. B Section

3.02 The more-than-one use of frame unit SDs in a frame may preclude the indication of connections to specific frame units within a frame. For this reason, lead destinations to these other frame units are usually indicated in the B section with the notation TO CONN CKT.

C. G Section, Cabling Diagrams (CADs)

3.03 The principal difference in the G sections of frame unit SDs is that CAD1 is set aside to list all of the FS leads for which the destination TO CONN CKT is shown. The frame unit SD CAD1 format is similar to the tabular symbol presentation used in CP drawings, as shown in Fig. 20, Sheet 2. Under an overall CAD1 heading, the several circuitry subdivisions of a frame unit are identified with a subheading ELEMENT IDENTIFIER A, B, C, etc, plus a title, as shown in Fig. 24. Under each of these subcaptions is a tabular listing of the ELEMENT leads involved.

3.04 ***Unit Symbol, CAD1 Tabular Arrangement:*** The specific tabular arrangement used in CAD1, below each of the ELEMENT IDENTIFIER and title subheadings, is shown in Fig. 7. In the example shown in this figure, entries in the ACCESS TERM. and FS TERM. columns differ. This indicates that, in this case, the intraframe leads from a frame unit CP terminate at a terminating device (a connector unused by a CP) at another location.

3.05 ***Unit Symbol, CAD1 Tabular Headings:*** Information covered by entries in the tabular columns of Fig. 7 is as follows:

COLUMN	EXPLANATION
TERM. MOD	Frame unit SD lead designation which is used as a terminal modifier at the frame SD level (similar to CP terminal modifier).
FUNC	Lead function: input, output, etc, as defined by frame unit SD.
ACCESS TERM.	Terminals on a frame unit terminating device to which input and output connections to the frame unit are made.

---

* When cable numbers are required, the WE-assigned numbers are used. For initial issue of the SD, if WE cable numbers are not available, BTL assignments are noted for reference only.

COLUMN	EXPLANATION
FS TERM.	FS backplane CP terminations of a unit from which connections are made to ACCESS TERMs. Inputs and outputs to the frame unit can also be made directly to or from FS TERMs, in which case the entries in the ACCESS and FS TERM. columns would be identical.
LOC FS/SYM	Location of FS TERM. given by FS and symbol number.
CAD	When leads also run to other connecting devices the CAD number of the connecting device is shown.
OPT/NOTES	Options are shown in parentheses to indicate that the connections shown are provided only by the option specified. Other entries in this column reference lead wiring requirements that are usually covered either in FSs with an indication of pairing or in a 200-series equipment note of the SD. A typical entry for indicating wire pairing would appear as P/ATSPOBOG, indicating that the lead referenced in the TERM. MOD column is paired with the lead ATSPOBOG.

3.06 ***Interunit CADs:*** Leads of frame units that connect externally to circuits outside of the frames in which they are housed are generally accounted for in the CADs of the associated frame SDs, as described in paragraph 4.10. Other external leads of frame units not covered in CADs of frame SDs would be shown in CAD2, 3, etc, of the frame unit SDs.

3.07 ***Intra-Unit CADs:*** CADs for frame unit intra-unit connections may also be included in the G section of frame unit SDs. This will occur when backplane wiring convenience-connecting devices are used which are not shown in the FSs of the B section.

D. A Section, Drawing Indexes

3.08 Over the title box on sheet A1, a USED ON table appears that lists the frame SDs in which references are made to the frame unit SD. Also included in this table is the name of the Bell Laboratories control location for the system or project, as shown in Fig. 8. Lead indexes are omitted from this type of SD because they are accounted for in the unit symbol CAD1. The used on table does not appear on SDs for Common Systems application.

4. FRAME SDs

A. General

4.01 The purpose of frame SDs is to document the connecting circuitry between the frame units within a frame. In this documentation, the interconnections in the backplane between frame units are comparable to those shown between CPs in functional unit SDs. Frame units are represented in the frame SD by the contents of one or more symbols. The frame SD documentation may also include the circuitry for frame auxiliaries such as power supplies and fuse alarms. This circuitry is presented in the same format used for functional unit SDs. The frame unit interconnecting circuitry is also presented in essentially the same format except for minor differences, which are covered in the following paragraphs.

B. B Section

General

4.02 Each FS in a frame SD consists of the same three parts as a functional unit SD: IFDs, connection list tables, and composite diagrams. The information in each of these parts as they apply to frame SDs is as follows:

(a) ***IFDs:*** These diagrams indicate the backplane interconnections between frame units and any auxiliary circuitry.

(b) ***Connection List Tables:*** These tables provide frame unit and other component terminal connection details for all IFD leads.

(c) ***Composite Diagrams:*** These diagrams represent, in one or more composite forms, the circuit functions not readily apparent from IFDs alone. Same as paragraph 2.15.

CAD SUBCAPTION

--- TO CONNECTION ---					--- FROM CONNECTION ---				
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERM.	LEAD DESIG	TERMINATION	TERM.	OPT	NOTE
..... J4				65-47 JACK / TS (NOTE 3)					
69-47CP-505	FPCPBAO	CA141		305	FPCPBAO	72-28CP	316		
69-47CP-506	FPCCBAO	CA141		306	FPCCBAO	72-28CP	311		
69-47CP-507	FPSPBAO	CA141		307	FPSPBAO	72-28CP	216		
69-47CP-508	FPSCBAO	CA141		308	FPSCBAO	72-28CP	211		
⋮	⋮	⋮		⋮	⋮	⋮	⋮		

Fig. 5—Typical Tabular CAD Headings and Line Entries

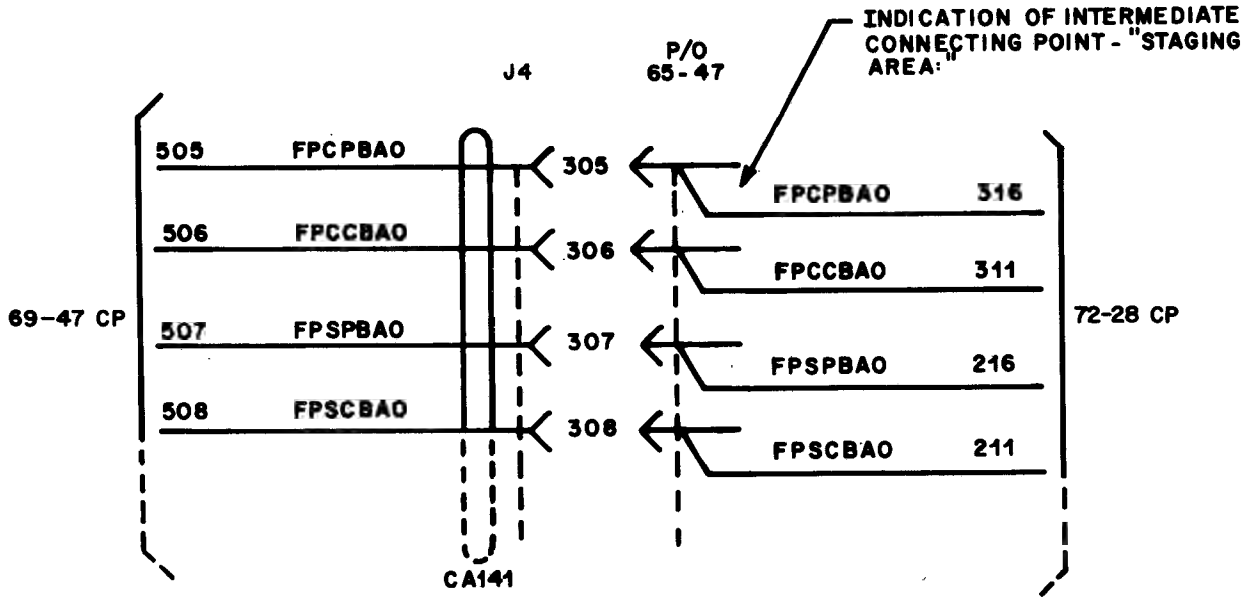

Fig. 6—Equivalent Graphical Representation of Entries in Tabular CAD of Fig. 13

ELEMENT IDENTIFIER
A

PERIPHERAL UNIT BUS 0

TERM. MOD	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	CAD	OPT/ NOTE
ATSPOAO	0	06-19-106	02-09-010	1/2		(X)
ATSPOBO	0	06-19-213	02-17-010	1/3		P/ATSPOBOG
ATSP1AO	0	06-19-107	02-19-110	1/4		203

TERM. NO.

CONNECTING DEVICE LOCATION ON FRAME UNIT

Fig. 7—Frame Unit SD CAD1 Tabular Arrangement

Interconnecting and Flow Diagrams (IFDs)

4.03 IFDs indicate the connections between frame units and other components at the backplane level. The frame units themselves are represented with rectangular symbols and the backplane circuitry is shown with FS and symbol number destinations indicated at the stub ends of IFD symbol lines. Destinations to other circuits are also indicated at the ends of these lines. Signal flow direction is indicated on these lines with directional arrows. Connections between symbols of the same FS are also shown on the same IFD.

4.04 ***Symbols Numbers:*** Same as paragraph 2.04.

4.05 ***Frame SD Symbol Entries:*** In addition to symbol number entries in IFD symbols, there are the standard entries for rectangular symbols, as follows:

(a) The functional name or description of the unit represented by the symbol.

(b) The functional designation assigned to (a).

(c) The location of the frame unit in the frame. This location is given by the coordinates that locate the lower left-hand corner of the frame unit as viewed from the front.

(d) The code number (equipment) of the frame unit. The SD number of the frame unit SD may also be shown in parentheses above the code.

(e) The frame unit element identifier (see paragraph 2.06, frame unit is substituted for circuit pack).

Typical symbol entries corresponding to (a) through (e) are shown in Fig. 9 in their usual arrangement.

Connection List Tables

4.06 Connection list tables provide specific frame unit and other component terminal information not shown in the IFDs. For each IFD symbol within an FS, there is a separate connection list table. For each designated IFD lead, there is a corresponding lead designation entry in a connection list table of the same symbol number. The purpose of connection list tables is to provide near-end connection information for backplane leads terminating at specific frame unit or other component terminals. These tables also pro-

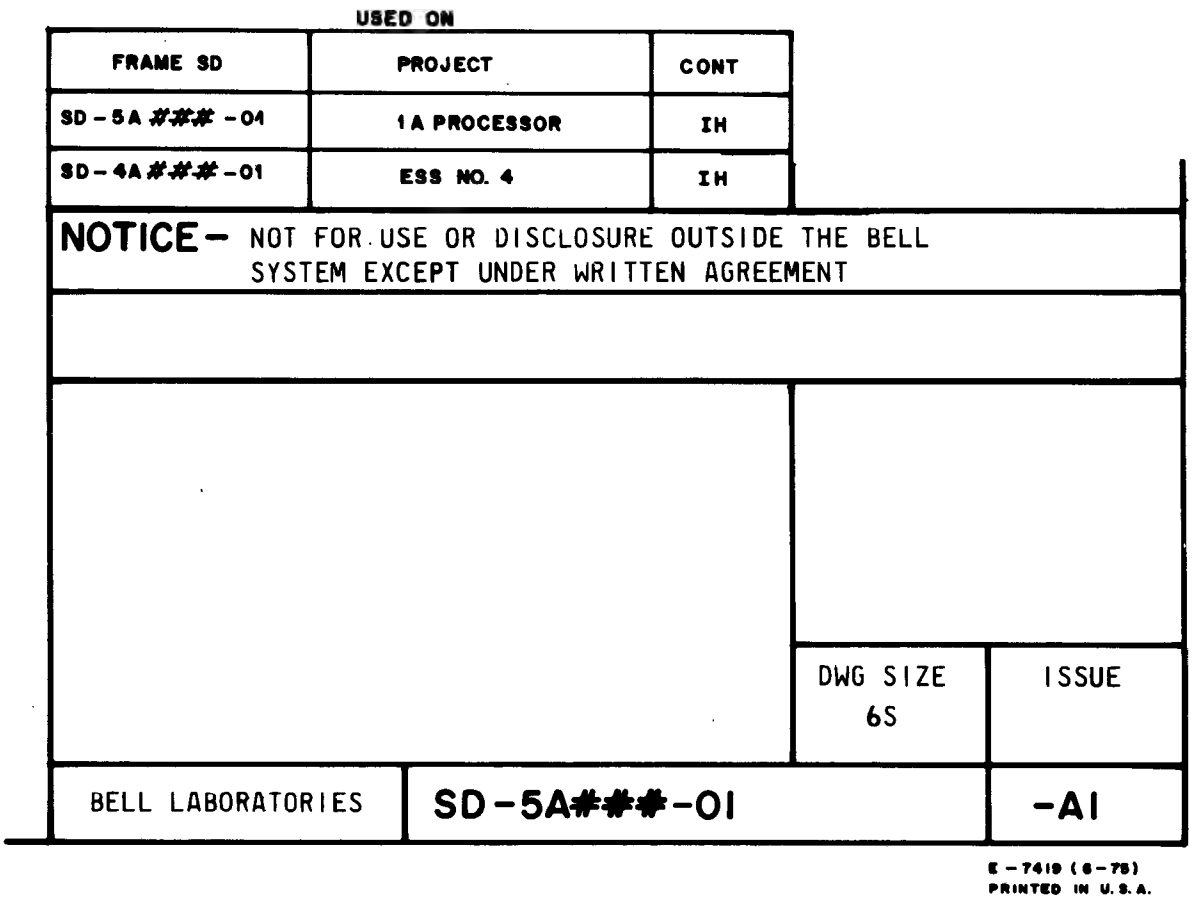

Fig. 8—"Used On" Table on Sheet A1 of a Frame Unit SD

vide the far-end destination in the documentation, ie, the FS and symbol number at which a lead terminates. When the destination of a lead is to another SD, the title of the SD is given in the tables.

4.07 ***Connection List Table Headings:*** Connection list tables have overall headings corresponding to all of the line entries in the IFD symbols. A typical table heading and column entry arrangement is shown in Fig. 10.

4.08 ***Connection List Table Columns:*** Columns in these tables fall into two categories. The columns at the left of the table are for entries pertaining to the FS and are shown under the common heading FRAME INFO. The columns to the right pertain to frame unit information and are shown under the common heading UNIT INFO. The contents of each of the separate columns under these columns headings are described as follows:

---FRAME INFO---

COLUMN	EXPLANATION
LEAD DESIG	The same designated leads associated with a particular IFD symbol (input or output) are listed in this column in alphanumeric order. The first entry in this column appears after the last unused unit access terminal number entered in the TERM. column. Typical LEAD DESIG column entries are shown in Fig. 10.
FUNC	The letters I or O are the usual entries in this column. They indicate whether a lead is essentially an input or output lead of a circuit element. When an output lead connects to one or more additional outputs, the letter combination OT is entered in the column. The letter T indicates that the transistor collectors of two or more gates are connected in a wire-node manner. (See also paragraph 2.12.)
TERM.	Access terminal numbers of the frame units are entered in this column. Used and unused terminals are listed, with the unused preceding the used terminals. The access terminal number is made up of the physical location of the terminal strip or connector on the frame unit and the terminal or pin number on the connecting device.
WRG OPT	Entries in this column identify wiring which is connected only when the indicated option is specified. In some cases, wiring options are shown within parentheses in the DESTINATION column preceeding the destination.
DESTINATION	In this column, the FS-to-FS destinations shown in the IFDs are shown again on an individual lead basis. Following the slash line of this entry, the symbol of the FS involved is also shown. Destinations to other circuits are also indicated. Separate FS and symbol number entries are separated with commas, as shown in the last entry in Fig. 10. Option letters, when applicable, are shown in parentheses in front of each of the destinations for the options.
NOTE	This entry is for reference to lead wiring requirements that are usually covered in FSs with the indication of pairing or in a 200-series equipment note of the SD. When reference is made in this column to a sheet note, the note will be shown directly below the table. A typical entry for indicating wire pairing would appear as P/3G042H1, indicating that the lead in the LEAD DESIG column is paired with lead 3G042H1.

---UNIT INFO---

COLUMN	EXPLANATION
TERM. MOD	Entries in this column show the lead designation by which a frame unit termination is identified in a frame unit SD. This entry is also referred to as the terminal modifier or function Net Name at the frame unit level.
LOC	This is the TERM. MOD column companion entry that provides the FS and symbol number information to locate the designated frame unit termination in its frame unit SD.

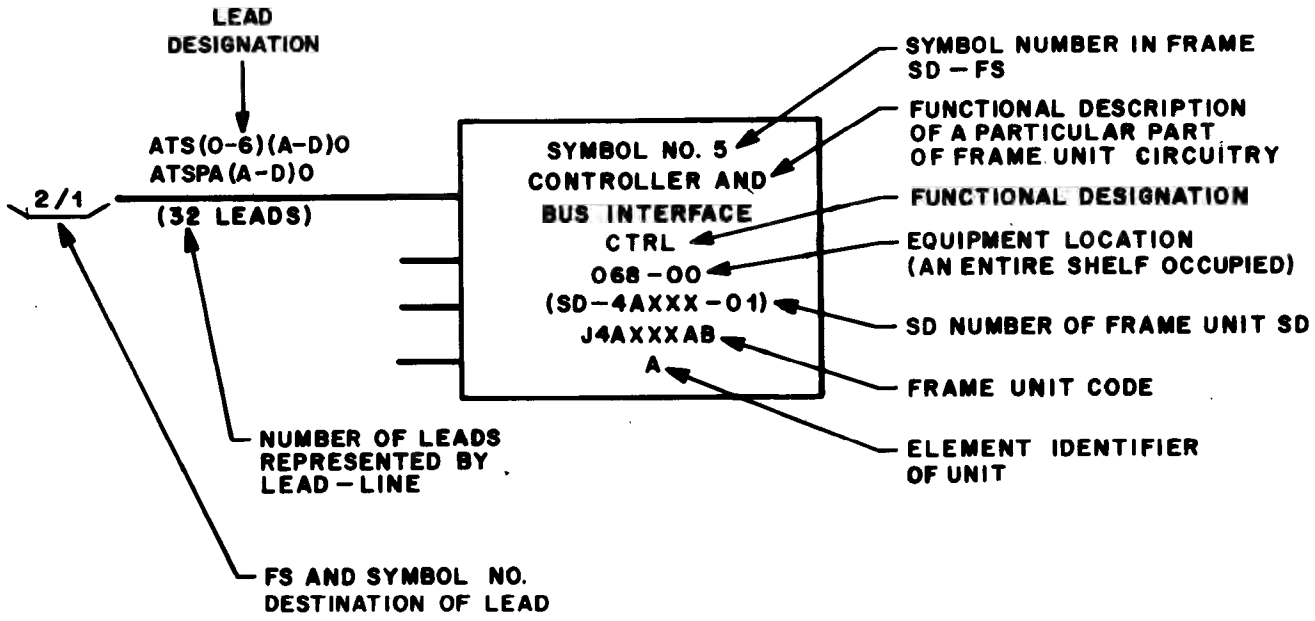

Fig. 9—Typical IFD Symbol Entries, Lead Line Designations, and One Method of Indicating Destinations of Lead Lines

C. C Section, App Fig.

4.09 In general, the content of an App Fig. in **2. C. C Section, Apparatus Figures** pertaining to functional unit SDs also applies to frame SDs. App Fig. of frame SDs account mainly for the frame units represented in FSs of the B section of the frame SD. Also covered in these App Fig. are the CPs and other components in the remainder of the frame. The frame unit information in the App Fig. is in tabular form with an arrangement essentially the same as for CPs, as described in paragraph 2.26. The only notable difference concerns equipment location coordinates of frame units. Since frame units normally occupy the full width of a frame shelf, their locations are given by the coordinates of the lower lefthand corner of the frame unit as viewed from the front. In specifying frame unit coordinationates with the lower left as the reference point, the X-coordinate*, for this reason, is usually −00. Typical frame unit entries in a frame SD App Fig. are shown in Fig. 11.

4.10 ***Duplicate Frame Units:*** Frame SDs, in which duplicate frame units are shown, have components of these frame units listed in separate App. Fig., with the same basic number but distinguished with the suffix letter A, as in App. Fig. 1 and App. Fig. 1A.

D. G Section, CADs

4.11 The CADs in the G section of frame SDs account for all leads that leave the frame and that connect to external circuits. Also included in frame SD CADs are the connections, mainly via cables, between frame units within the frame. The format for all of this CAD information is generally the same as for functional unit SD CADs, described in **2. F. G Section, Cabling Diagrams (CADs)** and illustrated in Fig. 5, 6, and 23. Fig. 12 illustrates how CAD information is presented when CP terminations to an external circuit are from a CP that has a location in the frame other than in a frame unit. Fig. 13 shows another frame SD CAD representation. This is for the situation in which CP terminations of a frame unit terminate in a terminal strip on the frame.

E. A Section, Drawing Indexes

4.12 The frame-SD A-section indexes are essentially the same as those for functional unit SDs, described in **2. B. A Section, Drawing Indexes.** One

---

* The left-to-right coordinate.

SYMBOL NO. 5

CONTROLLER AND BUS INTERFACE

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CTRL	068-00	J4AXXXAB	A	

FRAME INFO — UNIT INFO

LEAD DESIG	FUNC	TERM.	WRG OPT	DESTINATION	NOTE	TERM MOD	LOC
•	•	•		•	•	•	•
•	•	•		•	•	•	•
ATSOAAO	0	02-19-100		2/1		ATSPAAO	17/8
ATSOABO	0	02-19-300		2/1		ATSPABO	17/8
ATSOACO	0	02-19-001		2/1		ATSPACO	17/8
ATSOADO	0	02-19-201		(Z)2/1,(Y) 3/2		ATSPADO	17/8

OPTIONS

Fig. 10—Connection List Table and Column Headings for Frame SDs

APP FIG. 1

UNIT

EQPT LOC	044-00 — 068-00	EQPT LOC
DESIG	SW06-07 — CTRL	DESIG
EQPTCODE	J4AxxxAE — J4AxxxAB	EQPTCODE
OPTION		OPTION
ELEM IDENT		ELEM IDENT
CKT	DESIG FS/SYM — DESIG FS/SYM	CKT
A	SW06-07 2/4 — CTRL 2/5	A

Fig. 11—Typical Frame Unit Entries in a Frame SD App Fig.

--- TO CONNECTION ---					--- FROM CONNECTION ---		
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERM.	LEAD DESIG	TERMINATION	TERM.
		J2		062-04	JACK / CP (NOTE 6)		
TO SMF CKT	OSASW40G			001	OSASW40G		
	OSASW41G			002	OSASW41G		

NOTES:

6. THE FOLLOWING SHOWS THE SYMBOLIC EQUIVALENT TABULAR PRESENTATION

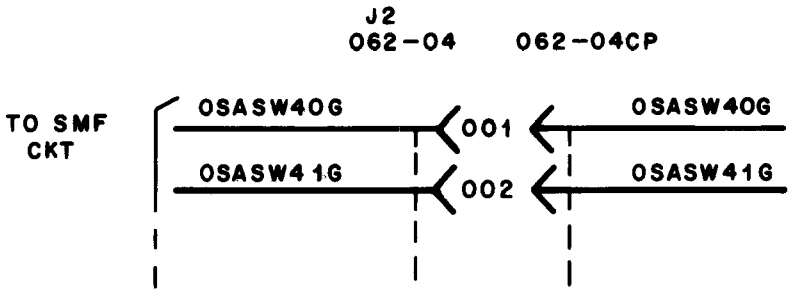

Fig. 12—CP Termination to External Circuit When CP Has a Frame Location Other Than in a Frame Unit—Tabular and Graphical Equivalent Representations Shown

--- TO CONNECTION ---					--- FROM CONNECTION ---		
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERM.	LEAD DESIG	TERMINATION	TERM.
. . . . . TSA				080-03	(NOTE 3)		
(NOTE 203)	DTESD10A			030	DTESD10A	048-00 UNIT	10-31-003
•	DTESD20A			031	DTESD20A	048-00 UNIT	10-31-202
•	•			•	•	•	•
•	•			•	•	•	•
•	•			•	•	•	•

NOTES:

•
•
•

3. THE FOLLOWING SHOWS THE SYMBOLIC EQUIVALENT TABULAR PRESENTATION

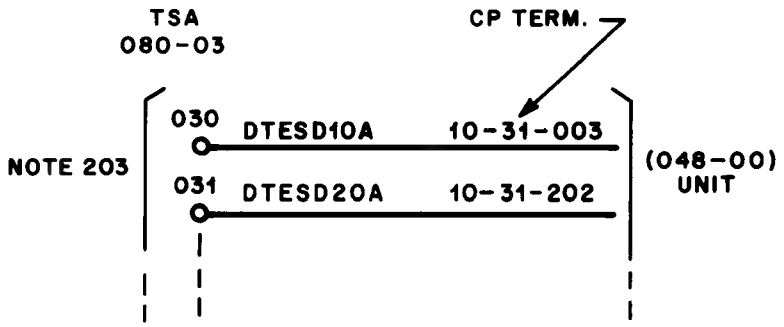

Fig. 13—CP Termination From Frame Unit to Terminal Strip on Frame—Tabular and Graphical Equivalent Representations Shown

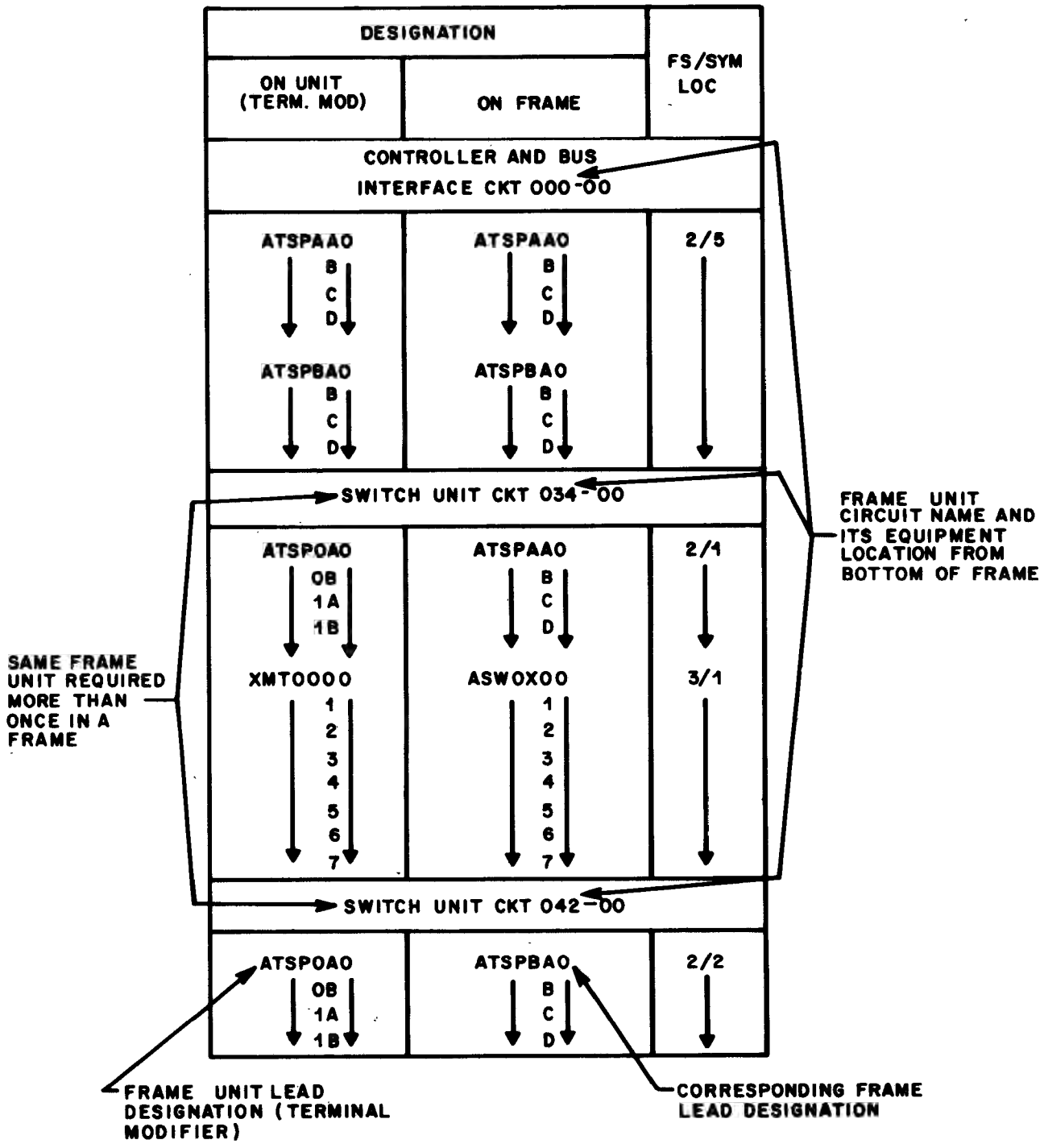

Fig. 14—Typical Intraframe Lead Index Illustrating Column Headings and Entries

difference is the listing of equipment J-coded frame units in an apparatus index. Another difference is the use of a special lead index for intraframe leads.

4.13 ***Apparatus Index:*** In this index, frame units are listed first under the heading UNIT. CPs are listed next and are followed by all other component categories in the usual alphabetical order.

4.14 ***Lead Indexes:*** Frame SDs have two lead indexes, the interframe lead index and the intraframe lead index. The interframe lead index serves the same purpose as a conventional lead index: it lists all of the leads externally connected to the frame. The external lead indexs shall have the same format as those used in functional unit SDs as specified in paragraph 2.23.

4.15 ***Intraframe Lead Indexes:*** An intraframe lead index is provided on a frame SD to correlate lead designations on frame unit SDs with lead designations on the frame SD. As shown in Fig. 14, intraframe lead indexes consist of tables with three principal columns, as follows:

(a) The ON-UNIT column lists frame unit SD lead designations that are referred to in the frame SD documentation as TERM. MODs (terminal modifiers).

(b) The ON-FRAME column lists designations corresponding to those in the ON-UNIT column assigned for identifying intraframe leads from a frame connectivity standpoint.

(c) The FS/SYM LOC column lists the location of leads designated in the ON-FRAME column in terms of FS and SYMBOL numbers in the B section of the frame SD.

Intraframe lead indexes permit users of frame unit SDs to work with a frame SD with only frame unit lead designations that can be converted to frame lead designations. Illustrated in Fig. 14 is a situation in which the same frame unit is used more than once (duplicated) in a frame SD, namely the SWITCH UNIT CKT. The distinction between such similar units within this index is indicated by the addition of frame equipment locations after circuit unit names, eg, 034-00 and 042-00.

5. CIRCUIT PACK INFORMATION SDs (CPI SDs)

A. General

5.01 As indicated in paragraph 1.07, CPI SDs contain information applicable on a system or project basis. These SDs, therefore, provide a list of CPs used in a system or project, and the circuit documentation for the CMs and ICs used in a system. These SDs consist of four sections: A, D, J, and K. The A section sheet index content is generally the same as that covered in paragraph 2.21. The content of the remaining three sections is covered in paragraphs 5.02 through 5.04.

B. D Section, Notes and Tables

5.02 This section of the SD contains the IC reference information usually shown in the D section

CP - SD CROSS REFERENCE

SD - DRAWING NUMBER AND TITLE	CP CODE													
	FA1	FA2		FA10	FA12	FA13			FA28	FA30	FA31	FA32	FA33	
SD-0A010-01 CENTRAL CONTROL	X	X			X	X					X	X	X	
SD-0A021-01 INPUT/OUTPUT				X		X			X	X				

Fig. 15—Typical Index of Circuit Pack Codes Shown in Section J of CPI Drawing

of an SD. The ICs covered in this SD section are those that have been used on the CPs and CMs of the system or project.

C. J Section, CPs

5.03 This section of the SD lists all the SDs of a system or project that contain references to CPs. The listing is by SD number with an adjacent listing of all of the apparatus codes of CPs referred to in each SD (see Fig. 15). These CPs are documented in CPS drawings. See Fig. 20, Sheets 1 and 2 for typical CPS circuit documentation and tabular symbol sheets.

D. K Section, CMs

5.04 This section of the SD contains all of the documentation for the CMs used in the system or project.

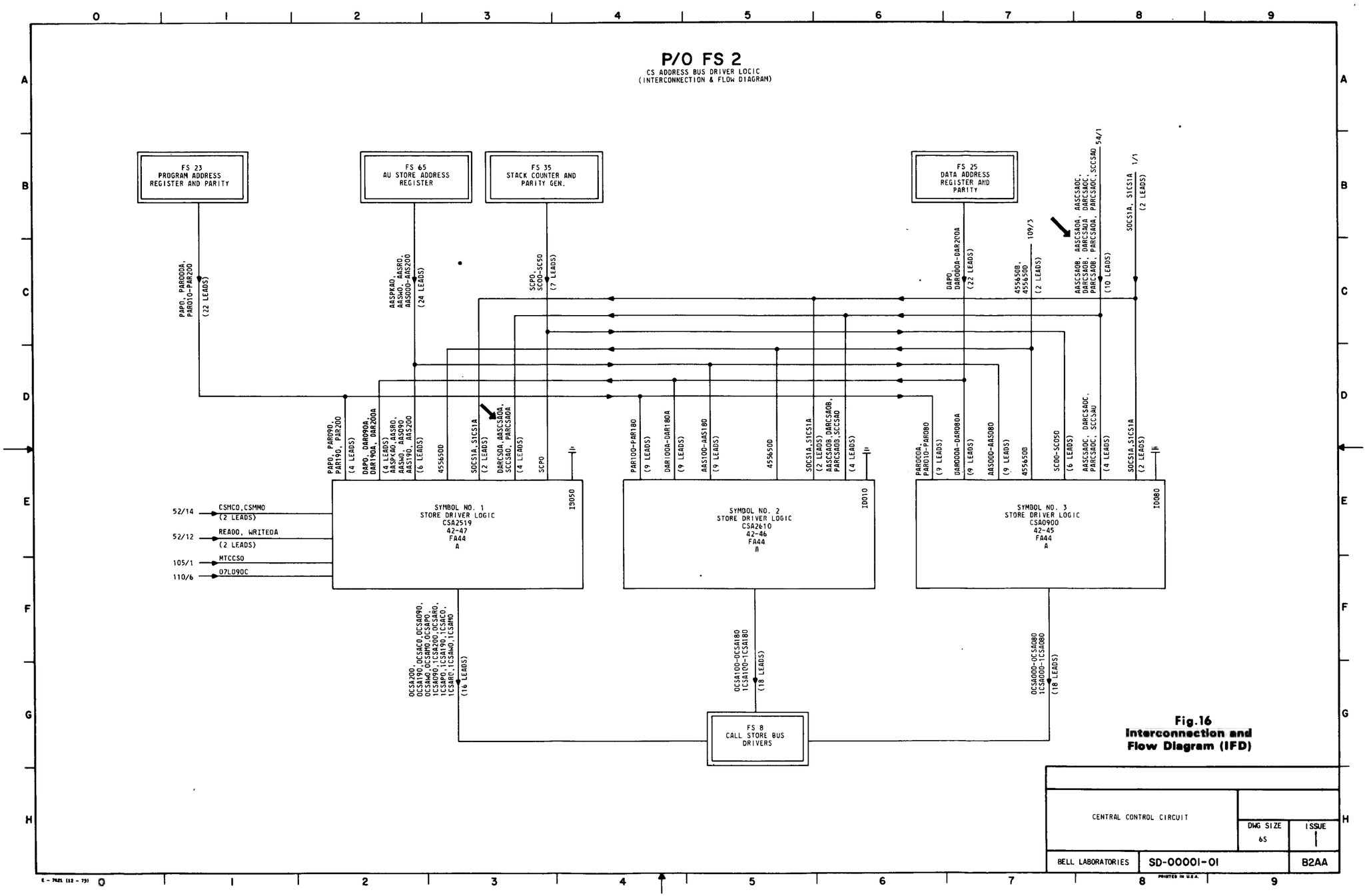

Fig.16
Interconnection and
Flow Diagram (IFD)

P/O FS 2
CS ADDRESS BUS DRIVER LOGIC

SYMBOL NO. 1
STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA2519	42-47	FA44	A	

LEAD DESIG	FUNC	TERM. MOD.	TERM.	WRG OPT	DESTINATION	NOTE
NC	I	01010	302			
NC	I	01020	306			
NC	0	00000	002			
NC	0	18090	216			
NC	0	18060	211			
NC	0	10040	309			
NC	0	10010	304			
NC	0	01000	102			
NC	0	1A000	003			
NC	0	10090	316			
NC	0	1C010	104			
NC	0	00010	202			
NC	0	18000	203			
NC	0	1A010	004			
NC	0	1C000	103			
NC	0	10000	303			
NC	0	10030	308			
NC	0	1A090	016			
NC	0	18010	204			
NC	0	1C090	116			
NC	0	1C070	113			
NC	0	18070	213			
NC	0	10070	313			
AASCSA0A	I	GSC800	107		54/1	
	I	GSC810	019		54/1	
AASPKA0	I	1C100	118		65/6	
AASR0	I	1C050	110		65/6	
AASW0	I	1C060	111		65/6	
AAS090	I	1C020	106		65/2	
AAS190	I	1C030	108		65/4	
AAS200	I	1C040	109		65/5	
CSMC0	I	1A070	013		52/14	
CSMM0	I	1A080	015		52/14	
	I	10080	315		52/14	
DAP0	I	1A100	018		25/1	
DARCSA0A	I	GSA810	101		54/1	
	I	GSA800	301		54/1	
DAR090A	I	1A020	006		25/2	
DAR190A	I	1A030	008		25/1	
DAR200A	I	1A040	009		25/1	
GRD042R	GRD		200			
GRD042M0	GRD		0GD			
GRD042M2	GRD		2GD			
GRD042T	GRD		319			
GRD4247T	I	18150	210			
MTCCS0	I	1C080	115		105/1	
	I	18080	215		105/1	
PAP0	I	18100	218		23/1	
PARCSA0A	I	GSB810	307		54/1	
	I	GSB800	312		54/1	
PAR090	I	18020	206		23/2	
PAR190	I	18030	208		23/1	
PAR200	I	18040	209		23/1	
READ0	I	10050	310		52/12	
	I	1A050	010		52/12	
SCCSA0	I	GSD810	112		54/1	
	I	GSD800	001		54/1	

SYMBOL NO. 1 (CONT)
STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA2519	42-47	FA44	A	

LEAD DESIG	FUNC	TERM. MOD.	TERM.	WRG OPT	DESTINATION	NOTE
SCP0	I	10100	318		35/1	
SDCS1A	I	SB01A	201		1/1	
S1CS1A	I	SB11A	219		1/1	
WRITE0A	I	1A060	011		52/12	
	I	10060	311		52/12	
0CSAC0	0	00070	214		8/4,8/11	
0CSAM0	0	00080	317		8/4,8/11	
0CSAP0	0	00090	017		8/7,8/14	
0CSAR0	0	00050	012		8/4,8/11	
0CSAW0	0	00060	014		8/4,8/11	
0CSA090	0	00020	005		8/6,8/13	
0CSA190	0	00030	205		8/7,8/14	
0CSA200	0	00040	007		8/7,8/14	
07L090C	I	C10	300		110/6	
1CSAC0	0	01070	314		8/18,8/25	
1CSAM0	0	01080	117		8/18,8/25	
1CSAP0	0	01090	217		8/21,8/28	
1CSAR0	0	01050	212		8/18,8/25	
1CSAW0	0	01060	114		8/18,8/25	
1CSA090	0	01020	105		8/20,8/27	
1CSA190	0	01030	305		8/21,8/28	
1CSA2U0	0	01040	207		8/21,8/28	
3V042DL	PWR		000			
	PWR		119			
4556500	I	C00	100		109/3	

SYMBOL NO. 2
STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA2610	42-46	FA44	A	

LEAD DESIG	FUNC	TERM. MOD.	TERM.	WRG OPT	DESTINATION	NOTE
NC	0	10090	316			
NC	0	10080	315			
NC	I	10070	313			
NC	I	1A090	016			
NC	I	10060	311			
NC	I	10020	306			
NC	I	10040	309			
NC	I	10030	308			
NC	I	1C090	116			
NC	I	10050	310			
NC	I	18090	216			
NC	I	1C100	118			
NC	I	10000	303			
NC	I	01090	217			
NC	I	10100	318			
NC	I	00090	017			
NC	I	18100	218			
NC	I	1A100	018			
NC	0	C10	300			
AASCSA0B	I	GSC810	019		54/1	
	I	GSC800	107		54/1	
AAS100	I	1C000	103		65/3	
AAS110	I	1C010	104		65/3	
AAS120	I	1C020	106		65/3	

SYMBOL NO. 2 (CONT)
STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA2610	42-46	FA44	A	

LEAD DESIG	FUNC	TERM. MOD.	TERM.	WRG OPT	DESTINATION	NOTE
AAS130	I	1C030	108		65/3	
AAS140	I	1C040	109		65/3	
AAS150	I	1C050	110		65/4	
AAS160	I	1C060	111		65/4	
AAS170	I	1C070	113		65/4	
AAS180	I	1C080	115		65/4	
DARCSA0B	I	GSA810	101		54/1	
	I	GSA800	301		54/1	
DAR100A	I	1A000	003		25/2	
DAR110A	I	1A010	004		25/2	
DAR120A	I	1A020	006		25/2	
DAR130A	I	1A030	008		25/2	
DAR140A	I	1A040	009		25/2	
DAR150A	I	1A050	010		25/2	
DAR160A	I	1A060	011		25/1	
DAR170A	I	1A070	013		25/1	
DAR180A	I	1A080	015		25/1	
GRD042B	GRD		200			
GRD042M0	GRD		0GD			
GRD042M2	GRD		2GD			
GRD042T	GRD		319			
GRD4268	I	10010	304			
PARCSA0B	I	GSB810	307		54/1	
	I	GSB800	312		54/1	
PAR100	I	18000	203		23/2	
PAR110	I	18010	204		23/2	
PAR120	I	18020	206		23/2	
PAR130	I	18030	208		23/2	
PAR140	I	18040	209		23/2	
PAR150	I	18050	210		23/2	
PAR160	I	18060	211		23/1	
PAR170	I	18070	213		23/1	
PAR180	I	18080	215		23/1	
SCCSA0	I	GSD810	112		54/1	
	I	GSD800	001		54/1	
SOCS1A	I	SB01A	201		1/1	
S1CS1A	I	SB11A	219		1/1	
OCSA100	0	00000	002		8/6,8/13	
OCSA110	0	00010	202		8/6,8/13	
OCSA120	0	00020	005		8/6,8/13	
OCSA130	0	00030	205		8/6,8/13	
OCSA140	0	00040	007		8/6,8/13	
OSCA150	0	00050	012		8/6,8/13	
OCSA160	0	00060	014		8/7,8/14	
OCSA170	0	00070	214		8/7,8/14	
OCSA180	0	00080	317		8/7,8/14	
1CSA100	0	01000	302		8/20,8/27	
1CSA110	0	01010	302		8/20,8/27	
1CSA120	0	01020	105		8/20,8/27	
1CSA130	0	01030	305		8/20,8/27	
1CSA140	0	01040	207		8/20,8/27	
1CSA150	0	01050	212		8/20,8/27	
1CSA160	0	01060	114		8/21,8/28	
1CSA170	0	01070	314		8/21,8/28	
1CSA180	0	01080	117		8/21,8/28	
3V042AL	PWR		000			
	PWR		119			
4556500	I	C00	100		109/3	

Fig. 17, Sheet 1
Connection List Table - Cont

P/O FS 2
SYMBOL (S) 1,2

CENTRAL CONTROL CIRCUIT	DWG SIZE 6S	ISSUE /
BELL LABORATORIES	SD-00001-01	B2CA

P/O FS 2
CS ADDRESS BUS DRIVER LOGIC

SYMBOL NO. 3
STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA0900	42-45	FA44	A	

LEAD DESIG	FUNC	TERM. MOD.	TERM.	WRG OPT	DESTINATION	NOTE
		IA090	016			
		IB090	216			
		IC090	116			
		ID090	316			
		ID060	311			
		ID070	313			
		IB100	218			
		ID130	318			
		IC100	118			
		00090	017			
		01090	217			
		C10	300			
		IA100	018			
AASCSA0C	I	GSCB00	107		54/1	
	I	GSCB10	019		54/1	
AAS000	I	IC000	103		65/1	
AAS010	I	IC010	104		65/1	
AAS020	I	IC020	106		65/1	
AAS030	I	IC030	108		65/1	
AAS040	I	IC040	109		65/1	
AAS050	I	IC050	110		65/2	
AAS060	I	IC060	111		65/2	
AAS070	I	IC070	113		65/2	
AAS080	I	IC080	115		65/2	
DARCSA0C	I	GSAB10	101		54/1	
	I	GSAB00	301		54/1	
DAR000A	I	IA000	003		25/3	
DAR010A	I	IA010	004		25/3	
DAR020A	I	IA020	006		25/3	
DAR030A	I	IA030	008		25/3	
DAR040A	I	IA040	009		25/3	
DAR050A	I	IA050	010		25/3	
DARC60A	I	IA060	011		25/3	
DAR070A	I	IA070	013		25/3	
DAR080A	I	IA080	015		25/2	
GRD042B	GRD		200			
GRD042M0	GRD		0GD			
GRD042M2	GRD		2GD			
GRD042T	GRD		319			
GRD4245T	I	ID080	315			
PARCSAD5	I	GSBB10	307		54/1	
	I	GSBB00	312		54/1	
PAR000A	I	IB000	203		23/3	
PAR010	I	IB010	204		23/3	
PAR020	I	IB020	206		23/3	
PAR030	I	IB030	208		23/3	
PAR040	I	IB040	209		23/3	
PAR050	I	IB050	210		23/3	
PAR060	I	IB060	211		23/3	
PAR070	I	IB070	213		23/3	
PAR080	I	IB080	215		23/2	
SCCSA0	I	GSDB00	001		54/1	
	I	GSDB10	112		54/1	
SC00	I	ID000	303		35/1	

SYMBOL NO. 3 (CONT)
STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA0900	42-45	FA44	A	

LEAD DESIG	FUNC	TERM. MOD.	TERM.	WRG OPT	DESTINATION	NOTE
SC10	I	ID010	304		35/1	
SC20	I	ID020	306		35/1	
SC30	I	ID030	308		35/1	
SC40	I	ID040	309		35/1	
SC50	I	ID050	310		35/1	
SOCS1A	I	SB01A	201		1/1	
SICS1A	I	SB11A	219		1/1	
OCSA000	0	00000	002		8/5,8/12	
OCSA010	0	00010	202		8/5,8/12	
OCSA020	0	00020	005		8/5,8/12	
OCSA030	0	00030	205		8/5,8/12	
OCSA040	0	00040	007		8/5,8/12	
OCSA050	0	00050	012		8/5,8/12	
OCSA060	0	00060	014		8/5,8/12	
OCSA070	0	00070	214		8/5,8/12	
OCSA080	0	00080	317		8/6,8/13	
1CSA000	0	01000	102		8/19,8/26	
1CSA010	0	01010	302		8/19,8/26	
1CSA020	0	01020	105		8/19,8/26	
1CSA030	0	01030	305		8/19,8/26	
1CSA040	0	01040	207		8/19,8/26	
1CSA050	0	01050	212		8/19,8/26	
1CSA060	0	01060	114		8/19,8/26	
1CSA070	0	01070	314		8/19,8/26	
1CSA080	0	01080	117		8/20,8/27	
3V0428L	PWR		000			
	PWR		119			
4556508	I	000	100		109/3	

Fig. 17, Sheet 2
Connection List Table - Cont

P/O FS 2
SYMBOL(S) 3

CENTRAL CONTROL CIRCUIT

DWG SIZE 6S | ISSUE 1

BELL LABORATORIES | SD-00001-01 | B2CB

P/O FS 54

MEMORY ADDRESS DECODER
(P/O INTERCONNECTION AND FLOW DIAGRAM)

SYMBOL NO. 1
MEMORY ACCESS DECODER
MAD
50-41
FA90
A

SYMBOL NO. 2
MEMORY ADDRESS DECODER FLIP-FLOPS 1
MDF1
46-40
FA91
A

CENTRAL CONTROL CIRCUIT

BELL LABORATORIES	SD-00001-01	DWG SIZE 6S	ISSUE —	B54AA

Fig. 18
Interconnection and Flow Diagram (IFD)

DESIGNATION MNEMONICS INDEX

MNEMONIC	FS NO.	DEFINITION
AASCSA	54	AUXILIARY UNIT SEQUENCER TO CS ADDRESS BUS
AASPKA	65	AUXILIARY UNIT STORE ADDRESS REGISTER - PARITY BIT
AASR	65	AUXILIARY UNIT STORE ADDRESS REGISTER - READ BIT
AASW	65	AUXILIARY UNIT STORE ADDRESS REGISTER - WRITE BIT
AASXX	65	AUXILIARY UNIT STORE ADDRESS REGISTER BIT XX (0 THRU 21)
CSMC	52	CS CONTROL MODE BIT
CSMM	52	MAINTENANCE MODE BIT
DARCSA	54	SELECT DAR TO CS ADDRESS BUS
DARXX	25	DATA ADDRESS REGISTER BIT XX (00-24)
MTCCS	105	CALL STORE MAINTENANCE MODE CONTROL
PAP	23	PROGRAM ADDRESS PARITY
PARCSA	54	SELECT PAR TO CSA
PARXX	23	PROGRAM ADDRESS REGISTER BIT XX (00-23)
READ	52	READ BIT ON ADDRESS
SCCSA	54	SELECT SC TO CS ADDRESS BUS
SCP	35	STACK COUNTER PARITY
SCXX	35	STACK COUNTER BIT XX (0 THRU 5)
WRITE	52	WRITE BIT ON ADDRESS
OCSAC	2	CALL STORE ADDRESS BUS 0 - CODE BIT
OCSAM	2	CALL STORE ADDRESS BUS 0 - MODE BIT
OCSAP	2	CALL STORE ADDRESS BUS 0 - PARITY BIT
OCSAR	2	CALL STORE ADDRESS BUS 0 - READ BIT
OCSAW	2	CALL STORE ADDRESS BUS 0 - WRITE BIT
OCSAXX	2	CALL STORE ADDRESS BUS 0 - BITS 00 THRU 20
1CSAC	2	CALL STORE ADDRESS BUS 1 - CODE BIT
1CSAM	2	CALL STORE ADDRESS BUS 1 - MODE BIT
1CSAP	2	CALL STORE ADDRESS BUS 1 - PARITY BIT
1CSAR	2	CALL STORE ADDRESS BUS 1 - READ BIT
1CSAW	2	CALL STORE ADDRESS BUS 1 - WRITE BIT
1CSAXX	2	CALL STORE ADDRESS BUS 1 - BITS 00 THRU 20
45S65	109	ADDRESS BUS LOW JITTER CLOCK

Fig. 19
Designation Mnemonics Index

CENTRAL CONTROL CIRCUIT	DWG SIZE 6S	ISSUE 1
BELL LABORATORIES	SD-00001-01	A2

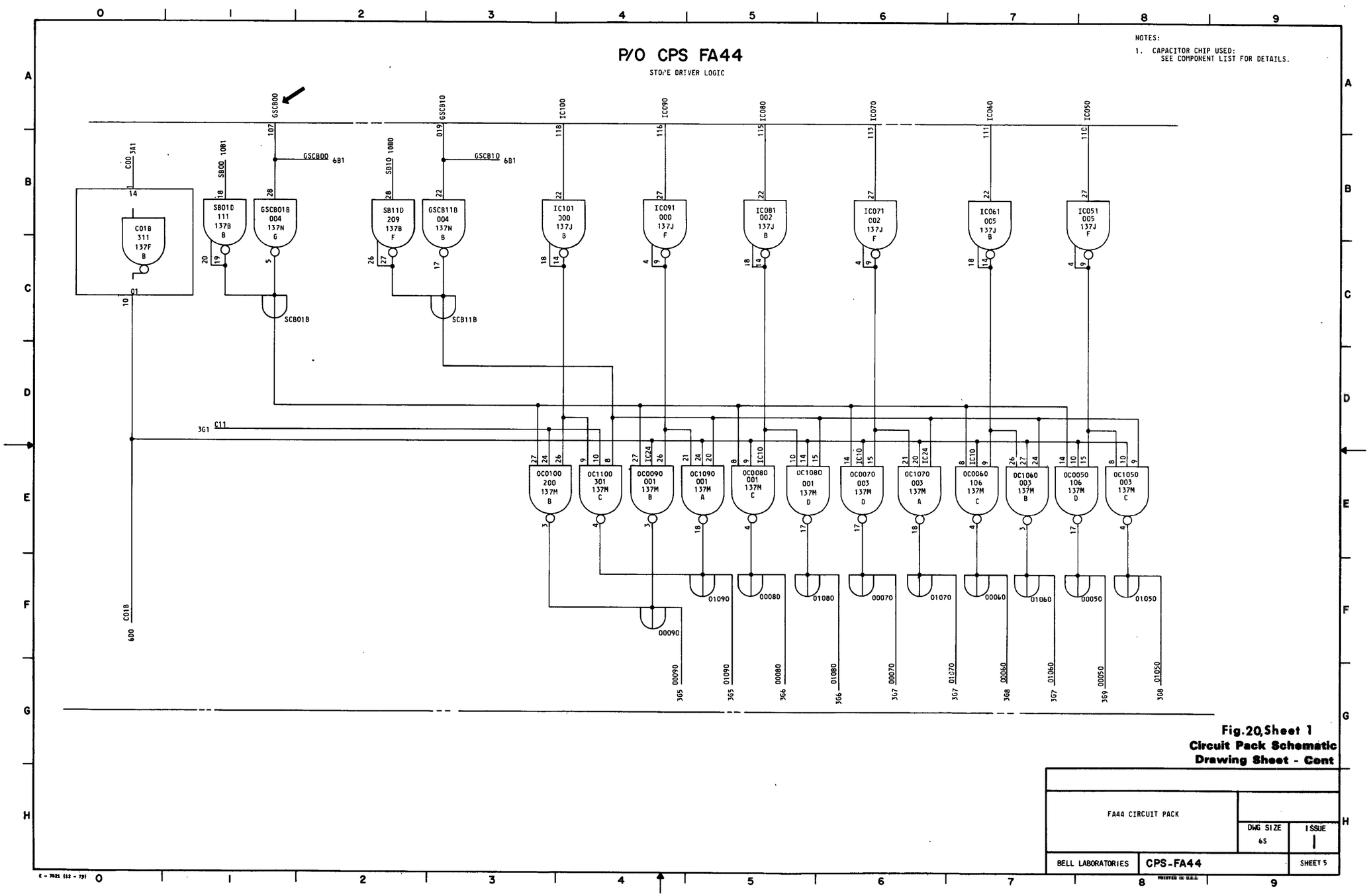

Fig.20,Sheet 1
Circuit Pack Schematic
Drawing Sheet - Cont

P/O CPS FA44
STORE DRIVER LOGIC

SYMBOL 1
STORE DRIVER LOGIC
ELEMENT IDENT
A

TERM. MOD	FUNC	TERM.	LOC.
C00	I	100	3A0
C10	I	300	3A1
GSAB00	I	301	9A3
GSAB10	I	101	9A2
GSBB00	I	312	7A3
GSBB10	I	307	7A2
GSCB00	I	107	5A1
GSCB10	I	019	5A3
GSDB00	I	001	3A4
GSDB10	I	112	3A2
IA000	I	003	10A5
IA010	I	004	10A4
IA020	I	006	10A4
IA030	I	008	10A3
IA040	I	009	10A2
IA050	I	010	9A8
IA060	I	011	9A7
IA070	I	013	9A6
IA080	I	015	9A5
IA090	I	016	9A5
IA100	I	018	9A4
IB000	I	203	8A5
IB010	I	204	8A4
IB020	I	206	8A4
IB030	I	208	8A3
IB040	I	209	8A2
IB050	I	210	7A8
IB060	I	211	7A7
IB070	I	213	7A6
IB080	I	215	7A5
IB090	I	216	7A5
IB100	I	218	7A4
IC000	I	103	6A5
IC010	I	104	6A4
IC020	I	106	6A4
IC030	I	108	6A3
IC040	I	109	6A2
IC050	I	110	5A8
IC060	I	111	5A7
IC070	I	113	5A6
IC080	I	115	5A5
IC090	I	116	5A4
IC100	I	118	5A4
ID000	I	303	4A6
ID010	I	304	4A5
ID020	I	306	4A4
ID030	I	308	4A3
ID040	I	309	4A2
ID050	I	310	3A8
ID060	I	311	3A7
ID070	I	313	3A7
ID080	I	315	3A6
ID090	I	316	3A5
ID100	I	318	3A4
SB01A	I	201	4A1
SB11A	I	219	4A1

TERM. MOD	FUNC	TERM.	LOC.
00000	0	002	4H6
00010	0	202	4H5
00020	0	005	4H4
00030	0	205	4H3
00040	0	007	4H3
00050	0	012	3G9
00060	0	014	3G8
00070	0	214	3G7
00080	0	317	3G6
00090	0	017	3G5
01000	0	102	4H6
01010	0	302	4H5
01020	0	105	4H4
01030	0	305	4H3
01040	0	207	4H2
01050	0	212	3G8
01060	0	114	3G7
01070	0	314	3G6
01080	0	117	3G6
01090	0	217	3G5

Fig. 20, Sheet 2
Circuit Pack Schematic
Drawing Sheet - Cont

FA44 CIRCUIT PACK		DWG SIZE 6S	ISSUE
BELL LABORATORIES	CPS-FA44		SHEET 2

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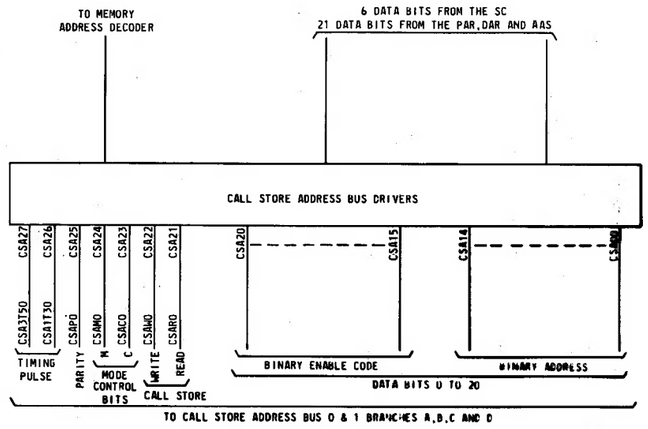
P/O FS 2

CS ADDRESS BUS DRIVER LOGIC

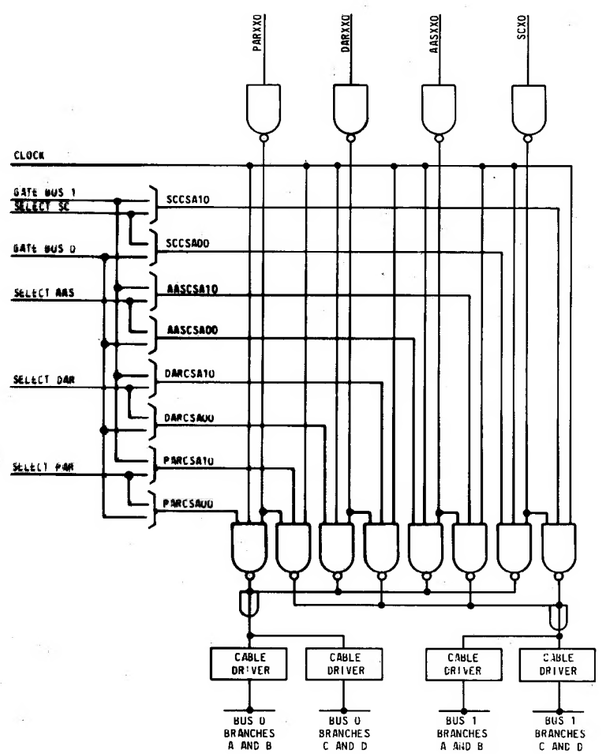
COMPOSITE DIAGRAM 1

FUNCTIONAL BLOCK DIAGRAM OF
CS ADDRESS BUS DRIVER LOGIC



COMPOSITE DIAGRAM 2

CALL STORE ADDRESS BUS BIT X
(REPRESENTATIVE BIT)



CIRCUIT OPERATION

THE PURPOSE OF THE CALL STORE ADDRESS BUS DRIVER LOGIC CIRCUIT IS TO SELECT FROM AMONG FOUR SOURCES OF CALL STORE ADDRESSES AND GATE THE DATA AT THESE SOURCES ON TO THE PROPER CALL STORE ADDRESS BUS. THE FOUR CALL STORE ADDRESSES ARE THE PROGRAM ADDRESS REGISTER (PAR), THE AUXILIARY STORE ADDRESS REGISTER (AAS), THE STACK COUNTER (SC), AND THE DATA ADDRESS REGISTER (DAR).

THE BUS SELECTION FUNCTION IS COMBINED WITH THE SOURCE SELECT LEAD IN THE MEMORY ADDRESS DECODER.

THE STACK COUNTER (SC) HAS ACCESS TO 64 ADDRESS LOCATIONS. THE TOP-OF-THE-STACK ADDRESS HAS A BINARY ENABLE CODE OF OCTAL 00. THE BINARY ADDRESS RANGE FOR THE STACK IS FROM OCTAL 2200 TO OCTAL 2277 OR 64 LOCATIONS.

THE PROGRAM ADDRESS REGISTER (PAR) SUPPLIES THE DATA ADDRESSES AND THE AUXILIARY STORE ADDRESS REGISTER (AAS) CONTAINS THE ADDRESS DATA FOR STORE ACCESSES FROM THE ASS COMMUNITY.

TWO TIMING PULSES ARE SENT TO THIS STORE COMMUNITY FOR EACH CENTRAL CONTROL (CC) CYCLE OVER THE SELECTED BUS. THE PARITY BIT, AASPKA, IS CALCULATED OVER BOTH THE BINARY ENABLE CODE AND ADDRESS BITS. BEING ODD, THIS BIT IS SENT TO THE STORE AT TIME INTERVAL 7T9. ALL OTHER BITS OF THE CALL STORE ADDRESS BUS ARE GATED OUT AT 5T7.

Fig. 21
Composite Diagrams

P/O FS 2 COMPOSITE DIAGRAMS 1 & 2

CENTRAL CONTROL CIRCUIT	DWG SIZE 6S	ISSUE 1
BELL LABORATORIES	SD-00001-01	B2GA

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PART OF APP FIG. 2

CIRCUIT PACK

EQPT LOC	42-12		42-13		42-14		42-15		42-16		42-23		42-24		42-25		42-26		42-27		42-28		42-30		42-31	
DESIG	AUWMISC		PSW1400		PSW2620		CSW1400		CSW2615														BR1106		BR1712	
EQPTCODE	FA48		FA48		FA48		FA48		FA48		FA154		FA154		FA154		FA154		FA154		FA154		FA61		FA61	
OPTION																										
ELEM IDENT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT
CKT	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM
A	AUWMISC	12/2	PSW1400	6/2	PSW2620	6/1	CSW1400	3/1	CSW2615	3/2	AWF0905	115/2	AWF1410	115/3	AWF1915	115/4	AWF0400	115/1	AWF2320	115/5	AWFMISC	115/6	BR1106	33/3	BR1712	33/2
B											AWS0905	115/8	AWS1410	115/9	AWS1915	115/10	AWS0400	115/7	AWS2320	115/11	AWSMISC	115/12				
C											ARR0905	115/14	ARR1410	115/15	ARR1915	115/16	ARR0400	115/13	ARR2320	115/17	ARRMISC	115/18				
D											AAS0905	65/2	AAS1400	65/3	AAS1915	65/4	AAS0400	65/1	AAS2120	65/5	AASMISC	65/6				
E																										
F																										

CIRCUIT PACK

EQPT LOC	42-32		42-33		42-34		42-37		42-38		42-39		42-40		42-42		42-43		42-44		42-45		42-46		42-47	
DESIG	BRP		BR0500		BR2318										PSA0900		PSA2610		PSA2519		CSA0900		CSA2610		CSA2519	
EQPTCODE	FA62		FA61		FA61		FA71		FA71		FA71		FA71		FA44		FA44		FA44		FA44		FA44		FA44	
OPTION																										
ELEM IDENT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT
CKT	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM
A	BRP	33/5	BR0500	33/4	BR2318	33/1	AB220C	28/4	AB2301	28/3	AB4624	28/2	AB4725	28/1	PSA0900	5/3	PSA2610	5/2	PSA2519	5/1	CSA0900	2/3	CSA2610	2/2	CSA2519	2/1
B							ABPR2	29/4	ABPR1	29/3	ABPL2	29/2	ABP11	29/1												
C																										
D																										
E																										
F																										

CIRCUIT PACK

EQPT LOC	42-48		42-49		42-54		42-55		42-56		42-57		42-59		42-60		42-61		42-62		42-63		42-64		42-65	
DESIG	AUA0900		AUAMISC										ODB7		ODB2		OD01		ODB4		ODB5		ODB1		RO42G1H1	
EQPTCODE	FA48		FA48		FA72		FA72		FA72		FA72		FA114		FA117		FA99		FA108		FA111		FA98		FC21	
OPTION																										
ELEM IDENT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT
CKT	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM
A	AUA0900	13/2	AUAMISC	13/1	HWR0500	31/4	HWR1106	31/3	HWR1712	31/2	HWR2318	31/1	ODB7	52/19	ODB2	52/8	OD01	52/4	ODB4	52/13	ODB5	52/16	ODB1	52/3	RO42G1H1	113/68
B					B00024	30/4	B00630	30/3	B01236	30/2	B01842	30/1														
C					OW0500	32/4	OW1106	32/3	OW1712	32/2	OW2318	32/1														
D																										
E																										
F																										

CIRCUIT PACK

EQPT LOC	42-66		46-05		46-06		46-08		46-09		46-11		46-12		46-13		46-14		46-16		46-17		46-18		46-22	
DESIG	RO42E1F1		RO46A3B1		RO46D1		PCB		G3ARHG				AUP		AVEE		AVEO				AUQ		AUGA		PROTCKT9	
EQPTCODE	FC21		FC21		FC22		FB5		FA228		FA158		FA152		FA155		FA155		FA159		FA156		FA157		FB6	
OPTION																										
ELEM IDENT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT
CKT	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM
A	RO42E1F1	113/82	RO46A3B1	113/63	RO46D1	117/65	PCB	113/97	G3ARHG	93/3	AUG	61/1	AUP	60/1	AVEE	62/1	AVEO	62/2	ABS	66/1	AUQ	87/1	AUGA	67/2	PROTCKT9	89/10
B											AUM	64/1							AUGB	67/3						
C																			AVM	62/3						
D																										
E																										
F																										

EQPT LOC
DESIG
EQPTCODE
OPTION
ELEM IDENT
CKT

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EQPT LOC
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EQPT LOC
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EQPT LOC
DESIG
EQPTCODE
OPTION
ELEM IDENT
CKT

A
B
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E
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Fig. 22
Apparatus Figure (APP FIG.)
Circuit Pack Tables

CENTRAL CONTROL CIRCUIT		DWG SIZE 6S	ISSUE 1
BELL LABORATORIES	SD-00001-01		C5

E - 7025 (12 - 79) PRINTED IN U.S.A.

CAD 001 (CONT'D)

TO CONNECTION					FROM CONNECTION					
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERMINAL	LEAD DESIG	TERMINATION		TERMINAL	OPT	NOTE
.....J2			65-40		JACK/TS					
		CA136		110						
		CA136		111						
		CA136		112						
		CA136		113						
69-40CP 314	STACTPC0	CA136		114	STACTPC0	58-28	CP	217		
69-40CP 315	PCSWCCE0	CA136		115	PCSWCCE0	58-62	CP	118		
69-40CP 316	FPCP30	CA136		116	FPCP30	62-49	CP	118		
69-40CP 317	PSWCCAE0	CA136		117	PSWCCAE0	58-61	CP	111		
69-40CP 318	EPCCACT0	CA136		118	EPCCACT0	58-28	CP	317		
		CA136		119						
.....J1			65-40		JACK/TS					
		CA137		310						
69-40CP 111	CLO1PS0	CA137		311	CLO1PS0	62-45	CP	115		
69-40CP 112	CLO2PS0	CA137		312	CLO2PS0	62-56	CP	013		
		CA137		313						
69-40CP 114	TSACTPC0	CA137		314	TSACTPC0	62-50	CP	105		
69-40CP 115	PCSWCC0	CA137		315	PCSWCC0	62-50	CP	306		
69-40CP 116	TPCP30	CA137		316	TPCP30	62-50	CP	011		
69-40CP 117	PSWCCAI0	CA137		317	PSWCCAI0	58-61	CP	306		
69-40CP 118	TPCCACT0	CA137		318	TPCCACT0	62-50	CP	302		
		CA137		319						
.....J3			65-47		JACK/TS					
		CA140		100						
69-47CP 301	PULAX00	CA140		101	PULAX00	62-44	CP	004		
69-47CP 302	PULAX10	CA140		102	PULAX10	62-44	CP	003		
69-47CP 303	PULAM000	CA140		103	PULAM000	62-44	CP	304		
69-47CP 304	PULAM010	CA140		104	PULAM010	62-44	CP	303		
69-47CP 305	PULAM100	CA140		105	PULAM100	62-44	CP	104		
69-47CP 306	PULAM110	CA140		106	PULAM110	62-44	CP	103		
69-47CP 307	PULAM200	CA140		107	PULAM200	62-44	CP	204		
69-47CP 308	PULAM210	CA140		108	PULAM210	62-44	CP	203		
		CA140		109						
.....J4			65-47		JACK/TS					
		CA141		300						
69-47CP 101	PSCSPS0	CA141		301	PSCSPS0	62-44	CP	305		
69-47CP 102	PSCSRS0	CA141		302	PSCSRS0	62-44	CP	105		
		CA141		303						
		CA141		304						
69-47CP 105	FPCPBA0	CA141		305	FPCPBA0	72-28	CP	316		
69-47CP 106	FPCCBA0	CA141		306	FPCCBA0	72-28	CP	311		
69-47CP 107	FPSPBA0	CA141		307	FPSPBA0	72-28	CP	216		
69-47CP 108	FPSCBA0	CA141		308	FPSCBA0	72-28	CP	211		
		CA141		309						
.....J2			65-47		JACK/TS					
		CA144		110						
69-47CP 311	00AAU10	CA144		111	00AAU10	54-53	CP	111		
69-47CP 312	00BAU10	CA144		112	00BAU10	54-53	CP	113		
69-47CP 313	00CAU10	CA144		113	00CAU10	54-53	CP	115		
69-47CP 314	00ACC10	CA144		114	00ACC10	62-44	CP	019		
69-47CP 315	00ACC20	CA144		115	00ACC20	62-45	CP	019		
		CA144		116						
		CA144		117						
69-47CP 318	00CCC10	CA144		118	00CCC10	62-44	CP	118		
		CA144		119						
.....J1			65-47		JACK/TS					
		CA145		310						
69-47CP 111	00CCC20	CA145		311	00CCC20	62-45	CP	118		
69-47CP 112	00ACS10	CA145		312	00ACS10	58-53	CP	112		
69-47CP 113	00ACS20	CA145		313	00ACS20	58-54	CP	104		
69-47CP 114	00ACS30	CA145		314	00ACS30	58-5.	CP	112		
69-47CP 115	00BCS10	CA145		315	00BCS10	58-53	CP	114		
69-47CP 116	00BCS20	CA145		316	00BCS20	58-54	CP	106		
69-47CP 117	00BCS30	CA145		317	00BCS30	58-54	CP	114		
69-47CP 118	00CCS10	CA145		318	00CCS10	58-53	CP	116		
		CA145		319						

CAD 001 (CONT'D)

TO CONNECTION					FROM CONNECTION					
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERMINAL	LEAD DESIG	TERMINATION		TERMINAL	OPT	NOTE
.....J3			65-56		JACK/TS					
		CA148		100						
69-56CP 301	10AAU10	CA148		101	10AAU10	54-53	CP	311		
69-56CP 302	10BAU10	CA148		102	10BAU10	62-44	CP	216		
69-56CP 303	10CAU10	CA148		103	10CAU10	54-53	CP	315		
69-56CP 304	10ACC10	CA148		104	10ACC10	62-44	CP	219		
69-56CP 305	10ACC20	CA148		105	10ACC20	62-45	CP	219		
		CA148		106						
		CA148		107						
69-56CP 308	10CCC10	CA148		108	10CCC10	62-44	CP	318		
		CA148		109						
.....J4			65-56		JACK/TS					
		CA149		300						
69-56CP 101	10CCC20	CA149		301	10CCC20	62-45	CP	318		
69-56CP 102	10ACS10	CA149		302	10ACS10	58-53	CP	312		
69-56CP 103	10ACS20	CA149		303	10ACS20	62-45	CP	318		
69-56CP 104	10ACS30	CA149		304	10ACS30	58-53	CP	312		
69-56CP 105	10BCS10	CA149		305	10BCS10	58-54	CP	304		
69-56CP 106	10BCS20	CA149		306	10BCS20	58-54	CP	312		
69-56CP 107	10BCS30	CA149		307	10BCS30	58-54	CP	314		
69-56CP 108	10CCS10	CA149		308	10CCS10	58-53	CP	316		
		CA149		309						
.....J2			65-56		JACK/TS					
		CA152		110						
69-56CP 311	DARB000B	CA152		111	DARB000B	62-39	CP	006		
69-56CP 312	DARB010B	CA152		112	DARB010B	62-39	CP	206		
69-56CP 313	DARB020B	CA152		113	DARB020B	62-39	CP	106		
69-56CP 314	DARB030B	CA152		114	DARB030B	62-39	CP	306		
69-56CP 315	DARB040B	CA152		115	DARB040B	62-39	CP	012		
69-56CP 316	DARB050B	CA152		116	DARB050B	62-39	CP	212		
69-56CP 317	DARB060B	CA152		117	DARB060B	62-39	CP	112		
69-56CP 318	DARB070B	CA152		118	DARB070B	62-39	CP	312		
		CA152		119						
.....J1			65-56		JACK/TS					
		CA153		310						
69-56CP 111	DARB080B	CA153		311	DARB080B	62-39	CP	018		
69-56CP 112	DARB090B	CA153		312	DARB090B	62-39	CP	218		
69-56CP 113	DARB100B	CA153		313	DARB100B	62-39	CP	118		
69-56CP 114	DARB110B	CA153		314	DARB110B	62-39	CP	318		
69-56CP 115	DARB120B	CA153		315	DARB120B	62-40	CP	006		
69-56CP 116	DARB130B	CA153		316	DARB130B	62-40	CP	206		
69-56CP 117	DARB140B	CA153		317	DARB140B	62-40	CP	106		
69-56CP 118	DARB150B	CA153		318	DARB150B	62-40	CP	306		
		CA153		319						
.....J4			65-63		JACK/TS					
		CA157		300						
69-63CP 101	CI4T6F0B	CA157		301	CI4T6F0B	62-56	CP	100		
69-63CP 102	CI4T6F0A	CA157		302	CI4T6F0A	62-56	CP	105		
		CA157		303						
		CA157		304						
		CA157		305						
		CA157		306						
		CA157		307						
69-63CP 108	PCLIN1	CA157		308	PCLIN1	58-61	CP	210		
		CA157		309						
.....J2			65-63		JACK/TS					
69-63CP 310	EXPA	CA160		110	EXPA	62-66	CP	108		
69-63CP 311	INTI10	CA160		111	INTI10	62-66	CP	311		
		CA160		112						
		CA160		113						
69-63CP 314	12G131	CA160		114	12G131	62-64	CP	312		
		CA160		115						
69-63CP 316	05GI061	CA160		116	05GI061	62-64	CP	011		
69-63CP 317	07G081	CA160		117	07G081					
69-63CP 318	10GI111	CA160		118	10GI111	62-64	CP	207		
69-63CP 319	NPAC	CA160		119	NPAC	62-66	CP	308		

CAD 001 (CONT'D)

TO CONNECTION					FROM CONNECTION					
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERMINAL	LEAD DESIG	TERMINATION		TERMINAL	OPT	NOTE
.....J1			65-63		JACK/TS					
69-63CP 110	SPA	CA161		310	SPA	62-66	CP	309		
69-63CP 111	PI476F0	CA161		311	PI476F0	62-56	CP	206		
		CA161		312						
		CA161		313						
		CA161		314						
		CA161		315						
		CA161		316						
		CA161		317						
69-63CP 118	+24VOSC	CA161		318	+24VOSC	62-63	CP	217		
69-63CP 119	+24V11	CA161		319	+24V11	62-66	CP	008		
.....J4			69-08		JACK/TS					
		CA102		300						
65-08CP 101	BRBCB160	CA102		301	BRBCB160	72-09	CP	207		
65-08CP 102	BRBCB170	CA102		302	BRBCB170	72-09	CP	206		
65-08CP 103	BRBCB180	CA102		303	BRBCB180	72-09	CP	205		
65-08CP 104	BRBCB190	CA102		304	BRBCB190	72-09	CP	005		
65-08CP 105	BRBCB200	CA102		305	BRBCB200	72-09	CP	004		
65-08CP 106	BRBCB210	CA102		306	BRBCB210	72-09	CP	203		
65-08CP 107	BRBCB220	CA102		307	BRBCB220	72-09	CP	202		
65-08CP 108	BRBCB230	CA102		308	BRBCB230	72-09	CP	002		
65-08CP 109	INTI15	CA102		309	INTI15	72-05	CP	311		
.....J3			69-08		JACK/TS					
		CA103		100						
65-08CP 301	S1CS1A	CA103		101	S1CS1A	72-12	CP	013		
65-08CP 302	S0CS1A	CA103		102	S0CS1A	72-12	CP	012		
65-08CP 303	S1PS1A	CA103		103	S1PS1A	72-12	CP	011		
65-08CP 304	S0PS1A	CA103		104	S0PS1A	72-12	CP	210		
65-08CP 305	MCINPCT0	CA103		105	MCINPCT0	72-11	CP	008		
65-08CP 306	MCCSR0	CA103		106	MCCSR0	72-11	CP	202		
65-08CP 307	MCPBR0	CA103		107	MCPBR0	72-08	CP	015		
65-08CP 308	MCDBR0	CA103		108	MCDBR0	72-07	CP	015		
		CA103		109						
.....J1			69-08		JACK/TS					
		CA106		310						
65-08CP 111	HAUB01	CA106		311	HAUB01	72-10	CP	011		
65-08CP 112	HAUB11	CA106		312	HAUB11	72-10	CP	210		
65-08CP 113	MCCCC00	CA106		313	MCCCC00	72-11	CP	207		
65-08CP 114	MCCCC10	CA106		314	MCCCC10	72-11	CP	206		
65-08CP 115	MCCCUB00	CA106		315	MCCCUB00	72-11	CP	205		
65-08CP 116	MCCCUB10	CA106		316	MCCCUB10	72-11	CP	005		
65-08CP 117	ACTCC1B	CA106		317	ACTCC1B	72-13	CP	016		
65-08CP 118	AUA1	CA106		318	AUA1	72-14	CP	015		
		CA106		319						
.....J2			69-08		JACK/TS					
		CA107		110						
65-08CP 311	ROUTMA1	CA107		111	ROUTMA1	72-13	CP	218		
65-08CP 312	REPC1	CA107		112	REPC1	72-13	CP	210		
65-08CP 313	R0CE1	CA107		113	R0CE1	72-12	CP	215		
65-08CP 314	R1CE1	CA107		114	R1CE1	72-12	CP	016		
65-08CP 315	R1CS0B	CA107		115	R1CS0B	72-12	CP	214		
65-08CP 316	S0CE1	CA107		116	S0CE1	72-12	CP	217		
65-08CP 317	S1CE1	CA107		117	S1CE1	72-12	CP	017		
65-08CP 318	R1CPD0	CA107		118	R1CPD0	80-17	CP	206		
		CA107		119						

Fig. 23
Cabling Diagram (CAD) Sheet

CENTRAL CONTROL CIRCUIT		DWG SIZE	ISSUE
		CZ	2A
BELL LABORATORIES	SD-00001-01		GB3

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CAD 1

UNIT SYMBOL

ELEMENT IDENTIFIER
A
PERIPHERAL UNIT BUS 0

TERM. MODIFIER	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	CAD	OPT/ NOTE
()NC()	I	06-22-212	06-22-212	20/1		
CCLCBR00	I	10-20-016	10-20-016	22/2		
CPSC100	I	10-20-217	10-20-217	22/2		
CPSGI0	O	10-20-019	10-20-019	22/2		
CPSGI0G	G	10-20-018				P/CPSGI0
CPSGI00	I	10-20-314	10-20-314	22/2		
CPSMIB0G	G	09-27-02				P/CPSMIB00
CPSMIB00	I	09-27-03	10-27-003	21/2		
CPSMIB1G	G	09-28-00				P/CPSMIB10
CPSMIB10	I	09-28-01	10-28-003	21/3		
CPSMIB2G	G	09-27-10				P/CPSMIB20
CPSMIB20	I	09-27-11	10-27-002	21/2		
CPSMI0	O	10-20-219	10-20-219	22/2		
CPSMI0G	G	10-20-218				P/CPSMI0
CPSMI00	I	10-20-215	10-20-215	22/2		
CSYNC00	I	05-20-23	06-20-206	16/11		
DBPE00A0	I	10-18-212	10-18-212	1/8		
DBPE01A0	I	10-19-010	10-19-010	1/7		
DBPE02A0	I	10-25-212	10-25-212	1/6		
DBPE03A0	I	10-26-114	10-26-114	1/5		
DBPE04A0	I	10-25-114	10-25-114	1/6		
DBPE05A0	I	10-26-318	10-26-318	1/5		
DBPE06A0	I	10-25-318	10-25-318	1/6		
DBPE07A0	I	10-19-212	10-19-212	1/7		
DBPE08A0	I	10-18-114	10-18-114	1/8		
DBPE09A0	I	10-19-114	10-19-114	1/7		
DBPE10A0	I	10-18-318	10-18-318	1/8		
DBPE11A0	I	10-19-318	10-19-318	1/7		
DBPM00A0	I	10-18-010	10-18-010	1/8		
DBPPEVA0	I	10-25-010	10-25-010	1/6		
DBPP00A0	I	10-26-212	10-26-212	1/5		
DBPP00A0	I	10-27-012	10-27-012	1/1		
DBPP01A0	I	10-28-012	10-28-012	1/2		
DBPP02A0	I	10-27-314	10-27-314	1/1		
DBPP03A0	I	10-28-314	10-28-314	1/2		
DBPP04A0	I	10-27-118	10-27-118	1/1		
DBPP05A0	I	10-28-118	10-28-118	1/2		
DBPP06A0	I	10-17-012	10-17-012	1/3		
DBPP07A0	I	10-16-012	10-16-012	1/4		
DBPP08A0	I	10-17-314	10-17-314	1/3		
DBPP09A0	I	10-16-314	10-16-314	1/4		
DBPP10A0	I	10-17-118	10-17-118	1/3		
DBPP11A0	I	10-16-118	10-16-118	1/4		
DBPP12A0	I	10-26-012	10-26-012	1/5		
DBPP13A0	I	10-25-012	10-25-012	1/6		
DBPP14A0	I	10-26-314	10-26-314	1/5		
DBPP15A0	I	10-25-314	10-25-314	1/6		
DBPP16A0	I	10-26-118	10-26-118	1/5		
DBPP17A0	I	10-25-118	10-25-118	1/6		
DBPP18A0	I	10-19-012	10-19-012	1/7		
DBPP19A0	I	10-18-012	10-18-012	1/8		
DBPP20A0	I	10-19-314	10-19-314	1/7		
DBPP21A0	I	10-18-314	10-18-314	1/8		
DBPP22A0	I	10-19-118	10-19-118	1/7		
DBPP23A0	I	10-18-118	10-18-118	1/8		
DBPP24A0	I	10-28-212	10-28-212	1/2		
DBPP25A0	I	10-27-212	10-27-212	1/1		
DBPP26A0	I	10-28-114	10-28-114	1/2		
DBPP27A0	I	10-27-114	10-27-114	1/1		
DBPP28A0	I	10-28-318	10-28-318	1/2		
DBPP29A0	I	10-27-318	10-27-318	1/1		
DBPP30A0	I	10-16-212	10-16-212	1/4		
DBPP31A0	I	10-17-212	10-17-212	1/3		
DBPP32A0	I	10-16-114	10-16-114	1/4		
DBPP33A0	I	10-17-114	10-17-114	1/3		
DBPP34A0	I	10-16-318	10-16-318	1/4		

ELEMENT IDENTIFIER (CONT)
A
PERIPHERAL UNIT BUS 0

TERM. MODIFIER	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	CAD	OPT/ NOTE
DBPP35A0	I	10-17-318	10-17-318	1/3		
DRPB0ASO	O	07-23-35	06-23-35	21/1		
DRPB0PA0	O	06-23-019	06-23-019	21/1		
DRPB0000	O	10-27-100	10-27-100	21/2		
DRPB0010	O	10-28-100	10-28-100	21/3		
DRPB0020	O	10-27-001	10-27-001	21/2		
DRPB0030	O	10-28-001	10-28-001	21/3		
DRPB0040	O	10-27-005	10-27-005	21/2		
DRPB0050	O	10-28-005	10-28-005	21/3		
DRPB0060	O	10-17-100	10-17-100	21/4		
DRPB0070	O	10-16-100	10-16-100	21/5		
DRPB0080	O	10-17-001	10-17-001	21/4		
DRPB0090	O	10-16-001	10-16-001	21/5		
DRPB0100	O	10-17-005	10-17-005	21/4		
DRPB0110	O	10-16-005	10-16-005	21/5		
DRPB0120	O	10-26-100	10-26-100	21/6		
DRPB0130	O	10-25-100	10-25-100	21/7		
DRPB0140	O	10-26-001	10-26-001	21/6		
DRPB0150	O	10-25-001	10-25-001	21/7		
DRPB0160	O	10-26-005	10-26-005	21/6		
DRPB0170	O	10-25-005	10-25-005	21/7		
DRPB0180	O	10-19-100	10-19-100	21/8		
DRPB0190	O	10-18-100	10-18-100	21/9		
DRPB0200	O	10-19-001	10-19-001	21/8		
DRPB0210	O	10-18-001	10-18-001	21/9		
DRPB0220	O	10-19-005	10-19-005	21/8		
DRPB0230	O	10-18-005	10-18-005	21/9		
EAPUF00	O	10-20-014	10-20-014	22/2		
HDUP1	1	05-19-03	06-19-003	16/10		
HDUP1G	G	05-19-02				P/HDUP1
HNM00	I	07-28-15	06-28-111	9/1		
HNM00G	G	07-28-14				P/HNM00
HNM10	I	07-28-37	06-28-311	9/1		
HNM10G	G	07-28-36				P/HNM10
HPE1	I	06-17-306	06-17-306	3/2		
HPE1G	G	06-17-206				P/HPE1
HP01	I	06-17-305	06-17-305	3/1		
HP01G	G	06-17-304				P/HP01
PPA(00)	I	10-41-311	10-41-311	22/1		
PPA(01)	I	10-41-312	10-41-312	22/1		
PPB(00)	I	10-41-211	10-41-211	22/1		
PPB(01)	I	10-41-212	10-41-212	22/1		

ELEMENT IDENTIFIER
B
TIME SLOT MEMORY ADDRESS BUS

TERM. MODIFIER	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	CAD	OPT/ NOTE
ATSPAA0	0	02-19-100	02-19-100	17/8		
ATSPAB0	0	02-19-300	02-19-300	17/8		
ATSPAC0	0	02-19-001	02-19-001	17/8		
ATSPAD0	0	02-19-201	02-19-201	17/8		
ATSPBA0	0	02-19-002	02-19-002	17/8		
ATSPBB0	0	02-19-102	02-19-102	17/8		
ATSPBC0	0	02-19-302	02-19-302	17/8		
ATSPBD0	0	02-19-203	02-19-203	17/8		
ATSPCA0	0	02-19-303	02-19-303	17/8		
ATSPCB0	0	02-19-004	02-19-004	17/8		
ATSPCC0	0	02-19-104	02-19-104	17/8		
ATSPCD0	0	02-19-005	02-19-005	17/8		
ATSPDA0	0	02-19-205	02-19-205	17/8		
ATSPDB0	0	02-19-305	02-19-305	17/8		
ATSPDC0	0	02-19-006	02-19-006	17/8		
ATSPDD0	0	02-19-106	02-19-106	17/8		
ATSPEA0	0	02-19-213	02-19-213	17/8		
ATSPEB0	0	02-19-313	02-19-313	17/8		
ATSPEC0	0	02-19-014	02-19-014	17/8		
ATSPED0	0	02-19-114	02-19-114	17/8		
ATSPFA0	0	02-19-314	02-19-314	17/8		
ATSPFB0	0	02-19-215	02-19-215	17/8		
ATSPFC0	0	02-19-315	02-19-315	17/8		
ATSPFD0	0	02-19-016	02-19-016	17/8		
ATSPGA0	0	02-19-116	02-19-116	17/8		
ATSPGB0	0	02-19-017	02-19-017	17/8		
ATSPGC0	0	02-19-217	02-19-217	17/8		
ATSPGD0	0	02-19-317	02-19-317	17/8		
ATSPHA0	0	02-19-118	02-19-118	17/8		
ATSPHB0	0	02-19-318	02-19-318	17/8		
ATSPHC0	0	02-19-019	02-19-019	17/8		
ATSPHD0	0	02-19-219	02-19-219	17/8		
ATSOAA0	0	02-20-100	02-20-100	17/1		
ATSOAB0	0	02-20-300	02-20-300	17/1		
ATSOAC0	0	02-20-001	02-20-001	17/1		
ATSOAD0	0	02-20-201	02-20-201	17/1		
ATSOBA0	0	02-20-002	02-20-002	17/1		
ATSOBB0	0	02-20-102	02-20-102	17/1		
ATSOBC0	0	02-20-302	02-20-302	17/1		
ATSOBD0	0	02-20-203	02-20-203	17/1		
ATSOCA0	0	02-20-303	02-20-303	17/1		
ATSOCB0	0	02-20-004	02-20-004	17/1		
ATSOCC0	0	02-20-104	02-20-104	17/1		
ATSOCD0	0	02-20-005	02-20-005	17/1		
ATSODA0	0	02-20-205	02-20-205	17/1		
ATSODB0	0	02-20-305	02-20-305	17/1		
ATSODC0	0	02-20-006	02-20-006	17/1		
ATSODD0	0	02-20-106	02-20-106	17/1		
ATSOEA0	0	02-20-213	02-20-213			
ATSOEB0	0	02-20-313	02-20-313	17/1		
ATSOEC0	0	02-20-014	02-20-014	17/1		
ATSOED0	0	02-20-114	02-20-114	17/1		
ATSOFA0	0	02-20-314	02-20-314	17/1		
ATSOFB0	0	02-20-215	02-20-215	17/1		
ATSOFC0	0	02-20-315	02-20-315	17/1		
ATSOFD0	0	02-20-016	02-20-016	17/1		
ATSOGA0	0	02-20-116	02-20-116	17/1		
ATSOGB0	0	02-20-017	02-20-017	17/1		
ATSOGC0	0	02-20-217	02-20-217	17/1		
ATSOGD0	0	02-20-317	02-20-317	17/1		
ATSOHA0	0	02-20-118	02-20-118	17/1		
ATSOHB0	0	02-20-318	02-20-318	17/1		
ATSOHC0	0	02-20-019	02-20-019	17/1		
ATSOHD0	0	02-20-219	02-20-219	17/11		
ATS1AA0	0	02-22-100	02-22-100	17/2		
ATS1AB0	0	02-22-300	02-22-300	17/2		

ELEMENT IDENTIFIER (CONT)
B
TIME SLOT MEMORY ACCESS BUS

TERM. MODIFIER	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	CAD	OPT/ NOTE
ATS1AC0	0	02-22-001	02-22-001	17/2		
ATS1AD0	0	02-22-201	02-22-201	17/2		
ATS1BA0	0	02-22-002	02-22-002	17/2		
ATS1BB0	0	02-22-102	02-22-102	17/2		
ATS1BC0	0	02-22-302	02-22-302	17/2		
ATS1BD0	0	02-22-203	02-22-203	17/2		
ATS1CA0	0	02-22-303	02-22-303	17/2		
ATS1CB0	0	02-22-004	02-22-004	17/2		
ATS1CC0	0	02-22-104	02-22-104	17/2		
ATS1CD0	0	02-22-005	02-22-005	17/2		
ATS1DA0	0	02-22-205	02-22-205	17/2		
ATS1DB0	0	02-22-305	02-22-305	17/2		
ATS1DC0	0	02-22-006	02-22-006	17/2		
ATS1DD0	0	02-22-106	02-22-106	17/2		
ATS1EA0	0	02-22-213	02-22-213	17/2		
ATS1EB0	0	02-22-313	02-22-313	17/2		
ATS1EC0	0	02-22-014	02-22-014	17/2		
ATS1ED0	0	02-22-114	02-22-114	17/2		
ATS1FA0	0	02-22-314	02-22-314	17/2		
ATS1FB0	0	02-22-215	02-22-215	17/2		
ATS1FC0	0	02-22-315	02-22-315	17/2		
ATS1FD0	0	02-22-016	02-22-016	17/2		
ATS1GA0	0	02-22-116	02-22-116	17/2		
ATS1GB0	0	02-22-017	02-22-017	17/2		
ATS1GC0	0	02-22-217	02-22-217	17/2		
ATS1GD0	0	02-22-317	02-22-317	17/2		
ATS1HA0	0	02-22-118	02-22-118	17/2		
ATS1HB0	0	02-22-318	02-22-318	17/2		
ATS1HC0	0	02-22-019	02-22-019	17/2		
ATS1HD0	0	02-22-219	02-22-219	17/2		
ATS2AA0	0	02-23-100	02-23-100	17/3		
ATS2AB0	0	02-23-300	02-23-300	17/3		
ATS2AC0	0	02-23-001	02-23-001	17/3		
ATS2AD0	0	02-23-201	02-23-201	17/3		
ATS2BA0	0	02-23-002	02-23-002	17/3		
ATS2BB0	0	02-23-102	02-23-102	17/3		
ATS2BC0	0	02-23-302	02-23-302	17/3		
ATS2BD0	0	02-23-203	02-23-203	17/3		
ATS2CA0	0	02-23-303	02-23-303	17/3		
ATS2CB0	0	02-23-004	02-23-004	17/3		
ATS2CC0	0	02-23-104	02-23-104	17/3		
ATS2CD0	0	02-23-005	02-23-005	17/3		
ATS2DA0	0	02-23-205	02-23-205	17/3		
ATS2DB0	0	02-23-305	02-23-305	17/3		
ATS2DC0	0	02-23-006	02-23-006	17/3		
ATS2DD0	0	02-23-106	02-23-106	17/3		
ATS2EA0	0	02-23-213	02-23-213	17/3		
ATS2EB0	0	02-23-313	02-23-313	17/3		
ATS2EC0	0	02-23-014	02-23-014	17/3		
ATS2ED0	0	02-23-114	02-23-114	17/3		
ATS2FA0	0	02-23-314	02-23-314	17/3		
ATS2FB0	0	02-23-215	02-23-215	17/3		
ATS2FC0	0	02-23-315	02-23-315	17/3		
ATS2FD0	0	02-23-016	02-23-016	17/3		

Fig. 24
Frame - Unit SD
CAD 1 Symbol

CONTROLLER AND BUS INTERFACE CIRCUIT	DWG SIZE 6S	ISSUE
BELL LABORATORIES	SD-00002-01	GB2

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